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ORIGINAL ARTICLES.

THE HISTORY AND DIAGNOSIS OF A CASE OF CARCINOMA OF THE STOMACH AND THE FIRST OPERATION OF EXCISION OF THE STOMACH IN AMERICA.

BY HUGO SUMMA, M.D., AND A. C. BERNAYS, M.D.

HISTORY OF THE CASE AND DIAGNOSIS.

By HUGO SUMMA, A.M., M.D., Professor of Pathology and Clinical Medicine at the Marion-Sims College of Medicine, St. Louis, Mo.

The patient was Mr. Conrad Beck, 42½ years old, a German, machinist, married, and the father of four children. The anamnesis shows a very good family history. The patient's mother is still living, while his father died of senile marasmus. All of his brothers and sisters are in good health and there is no inclination to diseases of the stomach in any member of the family.

The patient has always enjoyed good health, with the exception of an attack of measles when a boy. Does not remember any trauma, either in the region of the stomach or in any other part of his body.

In the early part of June 1897, the patient noticed pain in the region of the stomach, particularly severe upon after eating, and also a somewhat impaired action of the bowels amounting to constipation. Both of these symptoms appeared somewhat abruptly. About three weeks afterward, on June 25, 1897, he had four gastric hemorrhages within a day and a half. The blood was light red without admixture of air. Dr. Louis H. Davis, who attended him at that time, estimated the amount of blood lost at one and one-half gallons. In the early part of July, I was consulted for the first time in the case. The symptoms at that time were chiefly subjective. He complained of pain, which was increased during digestion, in the region of the stomach, and also of pain on pressure near the junction of the cartilages of the eighth and ninth ribs of the left side. There was at no time an impairment of the appetite nor any vomiting, but there was obstinate constipation. No tumor was visible or palpable.

After a thorough deliberation, in which the differential diagnosis between cancer and round ulcer was carefully considered, a decision in favor of round ulcer was made and Leube's treatment was instituted. The severe hemorrhages preceding the first consultation seemed to preclude the investigation of the case by means of test meals. It was a reasonable expectation to clear up the diagnosis *ex juvantibus* by the Leube treatment, but this proved to be the misleading feature and for three months obscured the clinical observation of the case. Leube himself lays great stress upon the value of his method of treatment as a means of confirming a doubtful diagnosis of *ulcus rotundum*: in fact, he says that the favorable result of the treatment justifies a conclusion in favor of the positive existence of an *ulcus rotundum*. Boas considers the same conclusion justifiable when his method of treatment is beneficial in the same kind of a case. His treatment consists in gradually increasing doses of nitrate of silver. This method was applied after the case was turned over to my exclusive supervision, in November, and was followed by even better results than Leube's treatment, which had undoubtedly benefited the patient during the months of July and August.

After a second consultation in September, Fleiner's treatment was tried, because on account of the beneficial results obtained by Leube's treatment we were under the impression that the case was one of round ulcer. The Boas treatment, which was tried in November, was followed by the most encouraging improvement, but December 24 a gradual recurrence of the old symptoms was noticed.

It now seemed justifiable to risk the introduction of the stomach tube and this was done every day for two weeks beginning December 26. Through the tube, Ewald's test-breakfast or Riegel's test-meal was expressed for the purpose of gaining a knowledge of the motor, secretory and digestive functions of the stomach.

The result of these gastranalyses was always the same. The total amount expressed never exceeded 20 c.cm. Free hydrochloric acid was never present, nor was there any lactic acid. The total acidity varied between 10 and 20 per cent. Yeast fungi and sarcinæ were absent and only very few bacteria were found by microscopic examination. Remnants of meat and starch, well advanced in digestion, occurred and red and white blood corpuscles were found in the same relative proportion as in the blood in each specimen of the stomachic contents that were examined microscopically. Toward the end of the expression of the contents, a very slight hemorrhage was noticeable macroscopically but no trace of tissue could ever be detected.

After carefully weighing the symptoms that presented themselves in this peculiar case there were left three points that appeared more in favor of carcinoma than of ulcer. These were permanent absence of hydrochloric acid, no vomiting and the age of the patient, while the remaining symptoms could be explained as well under the assumption of ulcer as of carcinoma.

The patient had lost twenty-seven pounds in weight during seven and one-half months. There was a cachectic appearance gradually becoming apparent, while the anemia seemed to be disappearing when judged by the visible mucous membranes.

Based upon these carefully observed facts a final diagnosis was made of ulcerated cancer of the stomach located between the cardia and the pylorus. The patient was then sent to Prof. Bernays for an explora-

tive section with a view of possibly removing the affected tissues.

THE OPERATION OF EXCISION OF THE STOMACH.

By AUGUSTUS CHARLES BERNAYS, A.M., M.D., Professor of Anatomy and Clinical Surgery at the Marion-Sims College of Medicine, St. Louis, Mo.

It has been known for years that the entire stomach can be successfully removed in dogs, and that these animals remain alive in perfect health for years. The best known case is the Czerny dog who lived over five years without a stomach and was then in perfect health when killed for the sake of a scientific experiment. Portions of the stomach have been successfully excised in cancer cases by over 150 surgeons. The parts removed involved from one-tenth to eight-tenths of the organ. The entire stomach was successfully removed from a female patient aged 53 years, at Zurich, by Dr. Schlatter. Six months after the operation the woman had gained twelve pounds in weight and is now in good general health.

In all cases that have ever been operated upon suffering from cancer of the stomach, the exact portion of the stomach which was to be removed was determined after the abdomen was opened. It is practically impossible to predict in any case the operation which must be performed. I have usually preferred palliative gastro-enterostomy to a partial excision of the stomach and in some cases have been satisfied to merely curette away the masses of neoplasm which were found obstructing the pyloric orifice.

There is no doubt in my mind after an experience of more than seventy palliative operations that these measures have been of benefit to the patients in prolonging life and in alleviating pain. In some cases the results were simply wonderful. I saw a patient upon whom I had done a gastro-enterostomy gain thirty-five pounds in weight in about two months and another from whom I curretted away over a pound of tumor-mass within the stomach, gained twenty pounds in one month. Both patients died within the year from the continuation of the carcinomatous cachexia and the continued growth of the neoplasms. Palliative operations in cancer cases are never indicated when a radical and scientific operation can be performed. For instance in cases of cancer of the breast and in uterine cancers which come to us early enough we no longer remove the tumor alone, but always the whole organ. We are not justified in merely removing the whole of the diseased organ, we must also remove the lymphatics leading away from the organ as completely as possible. I invariably do this radical operation in cancers of the breast and also of the womb. In the latter class of cases I have abandoned the old vaginal hysterectomy in favor of the operation of removing the broad ligaments and the womb through the abdomen. My mortality in the latter operation is less than 10 per cent. and no doubt will continue to decrease with a larger experience and a better technique. The length of time that patients remain free from a return is certainly much increased and there is a chance for a radical cure

No kind of cancer is more certainly fatal than cancer of the stomach, and if the operation of gastrectomy can be successfully performed it must be done early and before the cachexia has brought the patient to the brink of the grave. As in other organs the total removal of the stomach is the proper operation in incipient cases. In fact, there can scarcely be a doubt in the mind of any medical man that if an excision of a cancer of the stomach is to be made at all it ought to be a total excision. Partial excisions must be abandoned, and in fact have been abandoned in favor of gastro-enterostomy, curettement or some other merely palliative measures of treatment. I have not done a pylorectomy for over three years and I find that the Germans have almost abandoned the partial resections of the stomach in favor of palliative measures.

The future treatment of incipient cancer of the stomach will be the total or nearly total excision of the organ. Our plain duty is to work toward a perfection of the technique of this operation. My object in reporting the following fatal operation is to add what I have learned to the very meager stock of information we have about this new operation and to make some suggestions tending toward an improvement of its technique.

The patient, whose clinical history is detailed by Prof. Hugo Summa, entered the Rebekah Hospital Jan. 9, 1898. He was carefully prepared for the operation of celiotomy in the usual way, by baths, a purge and antiseptic pack, and by a properly restricted diet. The operation was begun January 11 at 9 A.M. and primarily consisted in an explorative abdominal

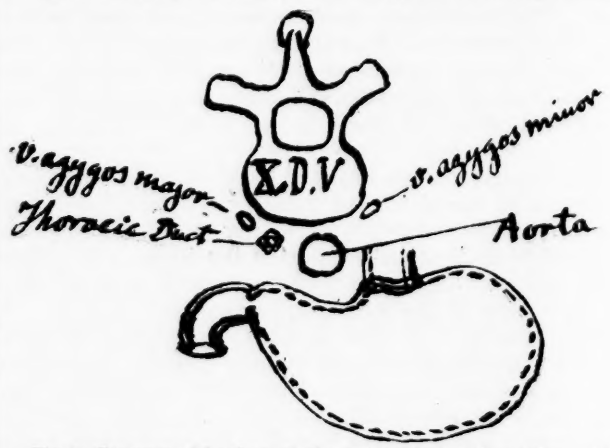
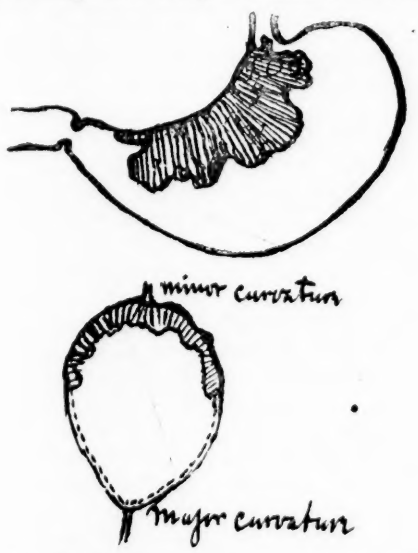


Fig. 1.—Diagram of horizontal plane at tenth dorsal vertebra. Distance from esophagus to pylorus shown in a normal case and is about one-fifth the length of the major curvature, usually not more than five inches.

section in the median line between and extending from the ensiform process to the umbilicus. The hand having been introduced and made to explore the entire surface of the stomach, detected a hard umbilicated irregular tumor involving the entire minor curvature of the stomach excepting about one inch of the pyloric end. There were only three small indurated lymph glands, and they were situated near the major curvature of the stomach in the omentum majus. The whole mass was freely movable, except where it was bound down to the pancreas by adhesions. There were no symptoms of obstruction and, in fact, the pylorus was normal. The operation of gastro-enterostomy was thus plainly contraindicated and the only thing to be done was a removal of the cancerous growth. I hesitated, but the conclusion that the extirpation of the diseased organ was the only rational thing to do was inevitable and I proceeded with the operation. The first step was the transverse section of the pyloric extremity of the stomach, one inch from the duodenum. I next closed the two orifices made by the cut by means of clamps. The duodenal end was drawn out of the abdomen and

placed upon the right side of the abdomen entirely out of the way. A large plug of gauze was inserted into the pyloric stump to prevent the escape of intestinal contents. The freeing of the posterior wall of the stomach from its adhesions to the pancreas was next done and was a piece of difficult dissection. I next ligated and cut off the stomach from its omental connections along the major curvature to the fundus. At this time, while drawing the fundus out of the cavity in order to ligate and cut off the gastro-splenic vessels and ligaments, a small quantity of gastric contents escaped, but was caught to a great extent upon pieces of gauze that were kept in readiness. The stomach was now free from all its connections excepting the minor curvature and the esophagus. There had been no hemorrhage of any account up to this time, as nearly all the vessels were tied before being cut. The entire operation was free from dangerous hemorrhage.

The separation of the minor curvature from the crura of the diaphragm, the aorta and the structures lying in front of the vertebral column was difficult only on account of the depth of the cavity, the necessity of operating in a badly illuminated field, so that



Figs. 2 and 3.—These diagrams show the manner and extent to which the stomach was involved in the neoplasm.

the sense of touch was often a more reliable guide than sight. I succeeded in freeing the minor curvature up to the esophagus by means of short clips with the curved scissors. The cancerous growth had shortened the distance between the cardia and the pylorus to about four inches. It was evidently a cancerous ulcer which had a tendency to become scirrhous. The outer surface of the growth was hard, while the inner or mucous surface was ulcerated.

After the entire stomach was freed from all its connections I caught the esophagus with a pair of forceps and cut it across about one-fourth of an inch above the cardia and found a small tongue-like piece of the cancer had grown into the esophagus but had its pedicle in the stomach. I also left a small strip of stomach attached to the esophagus, which I intended to use as a handle by means of which I could pull down the esophagus. This slip proved to be too weak and was soon afterward cut away.

The next step in the operation was the bringing together of the stump of the pylorus and the esophagus. The pyloric stump was freely movable and easily drawn upward, but the esophagus proved well-nigh unmanageable on account of its elasticity and great tendency to slip away through the foramen ovale of the diaphragm. The toothed forceps with which the assistants pulled the esophagus downward slipped off several times during the suturing which I now began. The method which I adopted of making a direct union between the stump of the pylorus and the esophagus seemed to be easier of accomplishment than the plan which Schlatter adopted of bringing up a loop of the jejunum. There was quite a disparity in the lumina of the esophagus and the pyloric stump, but the esophagus just above the cardia is very lax and dilatable

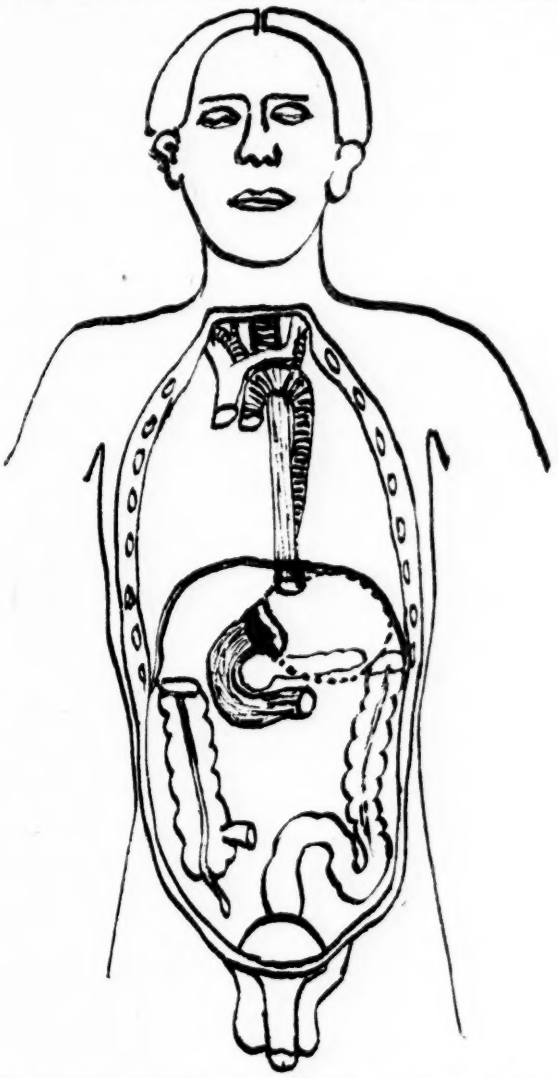


Fig. 4.—Diagram showing the stump of the pylorus pulled up and esophagus drawn out of the foramen ovale of the diaphragm.

I could easily introduce three fingers without stretching it perceptibly. I have successfully united the ascending colon to the ileum, end to end, and found that the closure was entirely satisfactory. The method I used in this case was simply to make the stitches in the pyloric stump a little farther apart than in the esophagus. The stitches included all the layers of the wall excepting the mucosa. I united the posterior wall first by a series of stitches which were tied upon the mucous side. These stitches united more than half the circumference of the orifices. Next, three stitches were inserted on the lateral aspects. The knots were tied upon the outer surface

of the canal. Lastly, three or four stitches were placed and tied externally upon the anterior aspect of the esophagus and the pylorus. The line of sutures was not as neat as I could have wished, but I was compelled to be satisfied with the work and as I will show later on the stitches held perfectly.

The space which was left after the removal of the stomach was filled out to a large extent by the transverse colon, the splenic flexure and the coils of the jejunum, which sank into the excavation of the diaphragm. I found it necessary, however, to fill up a part of the space by means of a gauze pack. The toilet of the peritoneum was made by means of dry gauze sponges. I use bi-sterilized gauze, made by Johnson & Johnson, of New York, which I found to be absolutely reliable. After the toilet had been most carefully completed I inserted two strips of the gauze, one upon each side of the line of union between the pylorus and esophagus. This was a precautionary measure and was intended to protect the general cavity against infection in case of a leak at the line of sutures. The ends of these two gauze strips as well as the ends of the gauze which lay between the transverse colon and the diaphragm were conducted out of the belly at the upper end of the median incision. The first incision was closed in the usual way up to the point of exit of the gauze drains. A large moist gauze dressing, which was held in place by a binder, was applied over all.

The entire operation had taken two hours and six minutes. Chloroform was the anesthetic used. Silk was used for all sutures and ligatures. An intravenous infusion of physiologic salt solution was made by Dr. Spencer Graves, who together with Dr. Robert E. Wilson and Dr. Frank M. Floyd, rendered me all necessary assistance. At the conclusion of the operation the patient was in fairly good condition; pulse was about eighty and of good volume. There was no pronounced shock, and indeed the patient rallied nicely from the immediate effects of the operation.

The patient was sustained by nutrient enemata and for the first twenty-two hours seemed to remain in the same condition, with the exception of an increased pulse rate, which ranged from 114 to 124 per minute. There seemed to be a fair chance for a successful termination. During the day, however, he grew weaker, complained of thirst and the pulse remained above 120 all the time. His temperature never reached 101 degrees and he succumbed about thirty-six and one-half hours after the operation.

We had no permission to perform a regular autopsy, but my assistants removed the gauze pack soon after death and found that there was no sign of peritonitis and that union between the sutured ends of the alimentary canal, which were in good apposition, was excellent. The cause of death is not quite clear, but I think that the long-continued chloroform narcosis and the impossibility of satisfactorily nourishing the patient, as well as the possibility of the absorption of some escaped stomach contents, must be held to be sufficient to explain the unfortunate result.

In future operations I shall use a rubber tube attached to a silk cord long enough to be passed up through the esophagus and out of the mouth. This tube I will leave in the duodenum, extending from about the beginning of the jejunum to near the opening of the larynx. By pulling it up into the pharynx nutrient predigested fluids can then be injected at regular intervals as may be deemed expedient.

In order to facilitate the suturing between the esophagus and the lower gut, be that the pylorus, the duodenum or the jejunum, I would suggest making the union before the stomach is completely cut off from the esophagus. By this means the esophagus can be pulled down and made accessible. Nearly all of the sutures can thus be inserted before the esophagus is cut off.

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THE PSYCHOLOGY AND PHYSIOLOGY OF THE LAYING ON OF HANDS AND OF HYPNOTISM.

Presented to the Section on Physiology and Dietetics at the Forty-Eighth Annual Meeting of the American Medical Association at Philadelphia, June 1-4, 1897.

BY RANDELL HUNT, M.D.

VICE-PRESIDENT OF THE SHREVEPORT MEDICAL SOCIETY AND MEMBER OF THE LOUISIANA STATE MEDICAL ASSOCIATION.

"The smallest hurts sometime increase and rage
More than all art of physic can assuage;
Sometimes the fury of the worst disease
The hand, by gentle stroking will appease."—*Solon.*

Socratic reasoning is being revived, and in the garb of Baconian induction is demonstrating particular truths and predicating general principles that astound even the learned, relegating to their proper place among the relics of barbaric times, intolerance, foolish ridicule, and impotent invective. No longer is the medical profession ready and eager to deride and martyrize a Harvey and a Jenner, nor a French Academy of Science to deny the actuality of meteorites; for science and wisdom walk hand in hand, giving to the world knowledge of universal truths, and power to observe and practice them.

Before man is in a position to take advantage of all these psychic facts that science is in some sort freeing from the mystery that has shrouded them, it is necessary for him to know the attributes and functions of mind, and so to appreciate his own potentiality and to cognize the harmony between individuality and nature. The correlative functioning of upper and lower brains—whether upper or lower—the interrelations of psychology and of physiology, become the matter for most close and searching investigation on the part of the student of the remarkable phenomena that are daily resultant from scientific experiment in the special fields under present consideration. Only by assiduous study of this nature can the scientist equip himself for individual attempt towards the solution of the human-enigma that still presents, despite all that has been achieved, the greatest difficulties and complexities.

The laying on of hands, hypnotism, normal sleep, spontaneous and artificial somnambulism, and dual consciousness, present such similar phases of mind conditions that I will endeavor to describe all as being subject to one general law, that of suggestion.

In doing this, first will be given a history of hypnotism; then sleep will be mentioned, dream consciousness, duality of mind; and finally an attempt will be made to demonstrate that through hypnosis and suggestion the different phenomena may be understood.

The history of hypnotism is as old as the history of the world, for the Chaldean priests, Brahmins and Parsi practiced this mode of treatment, while in China the curing of disease by the laying on of hands has prevailed for ages.

In the "Natural Law of Miracles," written in Arabic 400 years before Christ, not only is hypnotism mentioned, but the different methods of producing it described with an attempted physiologic solution of the psychic attitude. In Egypt friction during ablution was one of the great secret means of treatment, after which the patient rested on skins, and having indulged in prayer, prepared for sleep and awaited visions of Isis. Bernard de Claivaux, a French Cistercian monk, in 1146 said to the Alamannic people: "Ye soldiers of the Christ arise, and hurl down the enemies of the Cross!" Laying his hands on the blind and lame, he healed them, and the grateful people with tears and shouts proclaimed that the saints were with them.

Hippocrates, Aristotle, and Galen knew of the existence of somnambulism, but until Van Helmont and other modern authors recognized and studied the phenomena, no minute or accurate description was ever given of this condition.

Asclepiades of Bithynia obtained great renown as a physician in Rome by curing disease with frictions and the laying on of hands, at times producing by his methods sleep, which sleep he considered very salutary. For hundreds of years the kings of England and France cured scrofula (king's evil) by the touch of the hand, and writers of that time unite in attesting its efficiency.

The first authenticated cures by prayer and the laying on of hands in America were those performed by Alvar Nunez Cabaca de la Vaca, Alonzo dell Castillo Maldonado, Andres Dorantes and Estevanico, an Arabian negro, sole survivors of the unfortunate Narvaez expedition to Florida in the year 1535.

Valentine Graterakes, an Irish gentleman, in 1662, claimed to have had a dream, which he interpreted as a divine revelation, to the effect that he could cure disease by the laying on of hands, and many honorable witnesses bear testimony to his great success. The Lord Bishop of Derry in Ireland, in speaking of Greatrakes, says: "I was three weeks together with him at Lord Conway's, and saw him, I think, lay his hands upon a thousand persons; and really there is something in it more than ordinary; I have seen pains strangely fly before his hands, 'till he hath chased them out of the body—But yet I have many reasons to persuade me that nothing of all this is miraculous. He pretends not to give testimony to any doctrine; the manner of his operation speaks it to be natural; the cure seldom succeeds without reiterated touches; his patients often relapse; he fails frequently; he can do nothing where there is any decay in nature, and many distempers are not at all obedient to his touch." Joseph Glanville also speaks highly of Greatrakes.

Gassner, an ex-monk, conceived the idea that all diseases were due to possession by the Devil, and that they could be cured by exorcism, the truth of which he first demonstrated among his own parishioners. His cures caused such a great sensation that he went to Elwangen, but finally settled in Regenburg, where at one time he had ten thousand patients. Mesmer's attention being attracted to Gassner's remarkable cures, he went and observed his methods, and in an article afterward makes the important statement that Gassner's processes were in the main identical with his own.

Other instances could be presented showing the efficacy of the laying on of hands, but as the scope of this paper will not permit, I will at once proceed to analyze sleep and its cognate states, that the psychology and physiology of touch may be made clear.

Since a third of man's life is passed in slumber, it is equally important to physicians to understand thoroughly this condition, that they may the more perfectly appreciate the true relation of man to nature. Sleep is the quiescence of the nerves of sense and of the sensorium. It is more than a mere negation of waking, for it presents a positive side in dream, demonstrating that in this condition certain attributes, functions, and mental activities exist that either do not exist in the waking state, or are below the threshold of sensibility, i. e. of ordinary consciousness. The consciousness of waking is due to the activity of the cerebrum and the nerves of sense, while in sleep there is an inner-waking-dream; and if this inner-waking continues and is exalted, we must look for dream-consciousness in some other part of the brain than the cerebrum.

We have ideas in dreams or we would have no dreams, but as dream-images are confused, they are easily distinguished from the well regulated perceptive images of our waking consciousness, therefore must emanate from some part of the cerebro-spinal system from which we are practically excluded in waking life.

The dreams usually remembered are of a confused character, and ordinarily occur between waking and deep sleep, or between deep sleep and waking; and are insignificant, since they are connected with only a slight displacement of the threshold of sensibility.

A large percentage of dreams are not remembered, and as sense-perceptions seldom if ever pass out of recollection in a few hours, the only physiologic explanation is a different consciousness in the different organs in the dreaming and waking states. Du Prel pertinently says: "Deep dream must at the least depend on the activity of other folds of the brain than those in function while we are awake; possibly of another center altogether. For if we infer the similarity of the organ from that of the consciousness, the dissimilarity of the consciousness would imply the dissimilarity of the organ. And the failure of memory in the case of deep dream can only be ascribed to the want of a common organ with the waking consciousness, the survival of memory between the light dream and waking must result from at least partial community of organ. The withdrawal of the bridge of memory proves physiologically the change of organ, the preservation of the bridge a community of organ; but inasmuch as it is only with the change of an organ of whose nature we know nothing that the significant dream can occur, the logical possibility of the latter must again on this ground be admitted."

We, as physicians, know that this bridge of memory does fail between deep sleep and waking, for sometimes the dreamer will translate his dream into regulated action as in sleep-walking; or into coherent ideas and sound-images as in somnambulism.

In somnambulism difficult problems in mathematics with their intricate complexities are solved, and unless what mind was doing were self-cognized, the perceptions would be as heterogeneous as the confused phantasms of a dream in light sleep. This, however, is not true, for there are numerous authenticated instances in which complicated intellection occurred, Euclidian propositions demonstrated, and even literary works of marked genius composed in slumber. It is well known

that Voltaire wrote poetry in sleep, that Condorcet saw final steps of difficult calculations, and that in this condition Coleridge composed his fragment, "Kubla Kahn."

Whenever a thought, a feeling or a purpose stirs the human mind consciousness is there, whether in a confused dream or in the deepest stages of natural somnambulism; for while the phantasies of a dream may be only imperfectly recollected, the perception, representation, and perfectly constructed ideas of a somnambulist evince true memory directed by purpose.

Helmholtz proved that a definite measure of time was requsite for the transmission of an excitation by the nervous system, and that only a limited number of sensations could be appreciated by the cerebrum in a given period. In narcosis and somnambulism the contrary is easily made apparent, for longer successions of representations occur than the established physiologic limit of time would permit, logically and conclusively proving that the waking consciousness, with its physiologic measure of time is but one form of self-consciousness. Dr. Carl Du Prel assures us, "what is true of the light of the sun is thus true of the light of sense. As the one in its setting and rising neither produces nor destroys the stars, but occasions their optical appearance and disappearance; in like manner the dream consciousness emerges from or retreats into the unconscious, as the sense-consciousness goes down or rises."

To the dual theory of consciousness so beautifully and logically demonstrated by Du Prel, from whose arguments I have largely quoted, I will add in order to make plain and comprehensive one of nature's fundamental laws, Hudson's theory of the duality of the mind.

One phase of mind with its seat in the upper brain, is by Mr. Hudson called objective; the other located in the lower brain, subjective.

The objective mind from its post of observation in the cerebrum takes cognizance of the sense-world through the media of the five physical senses, is the product of man's needs, is under the control of reason and develops what we know as common sense. In man's battle with the material world the objective mind is his prop and staff, and normally is never controlled against reason by another person's suggestion, reasoning as it does analytically, synthetically, deductively and indeductively, and refusing to accept anything in opposition to achieved results.

The subjective mind, that of the lower brain (pons, medulla and chord), perceives by intuition independently of the physical senses; is the seat of the emotions, of imagination and of memory, and performs its highest functions only when objective consciousness is in abeyance, manifesting itself most potentially in spontaneous somnambulism and artificial hypnotic somnambulism. In this condition many of the most wonderful functions of the subjective or transcendental mind become manifest, such as reading the thoughts of others even to the minutest detail, and perceiving objects without respect to distance.

The most important and characteristic difference between the two minds is that the objective is never controlled against reason by the suggestion of another, while the subjective is unqualifiedly amenable to suggestion, provided the suggestion is not contrary to previously conceived ethical emotions, an assertion that hypnotism has made an established fact.

In hypnosis the subjective mind accepts every suggestion, no matter how absurd or contrary to objective experience except those suggestions opposed to instinct. It controls all the functions of the body, and also the circulation and the vasomotor system.

The ascendency of the transcendental or subjective mind over the objective produces the musician, the poet, the artist in any line, and when "exquisitely balanced" with the objective mind, as Mr. Hudson so beautifully shows us, a Shakespeare.

In proof that duality of mind is shown by both anatomy and physiology I may be permitted the same quotation from Surgeon-General Hammond that I made in a former paper on the same general subject.

Dr. Hammond in a paper entitled "The Brain not the Sole Organ of Mind," relates how he removed the brain of a frog and after waiting for the shock to pass put it in water, when it immediately began to swim. He placed his hand so as to stop it and its efforts ceased; taking away his hand it again commenced to swim. Pflüger removed the entire brain of a frog and applied acetic acid to the thigh over the inner condyle. The animal immediately rubbed the spot with the foot of the same side, making a voluntary movement and showing his appreciation of the locality of the irritation. The foot was then amputated and the acid was again applied, when the frog made an ineffectual effort with the amputated member and failing after a few movements rubbed the irritation with the other foot. This experiment with its demonstration of sensation and volition, is certified to by Prof. Austin Flint, who says he has often successfully produced the same phenomenon.

In certain monsters born without a brain, or with important parts of this organ absent, we have interesting examples of the persistence of instinct. "Syme describes one of these beings which lived for six months. Though very feeble it had the faculty of sucking, and the several functions of the body appeared to be well performed. Its eyes clearly perceived the light, and during the night it cried if the candle was allowed to go out. After death the cranium was opened and there was found to be an entire absence of the cerebrum, the place of which was occupied by a quantity of serous fluid contained in the arachnoid." "Ollivier d'Angers describes a monster of the female sex which lived twenty hours. It cried and could suck and swallow. There was no brain, but the spinal cord and medulla oblongata were well developed." "Saviard relates the particulars of a case in which there was no cerebrum, cerebellum, or any other intracranial ganglion. Yet this being opened and shut its eyes, cried, sucked and even ate broth. It lived four days. Some of these movements were reflex, but others were clearly instinctive and adapted to the preservation of life." "But all these instances as well as experiments referred to as having been performed on lower animals, show that instinct does not reside in the brain."

The duality of consciousness and the duality of mind have now been logically proven, but the practical advantages to be enjoyed depend entirely on discovering a psycho-physical method of inducing the transcendental state.

The science of hypnotism aids and furnishes the clue in this investigation by proving experimentally the existence of a stage of hypnosis short of sleep, in which the subjective emergence is sufficiently emphasized for satisfactory therapeutic work. In this specific biologic condition the objective mind is just sufficiently weakened to lose its normal state of con-

trol over the subjective mind; the subject appearing normal, but with an increased susceptibility to impressions through suggestion. All those familiar with hypnotism are aware that by boldly looking a patient in the eyes, and simultaneously suggesting total inability of resistance, he can be made to follow the hypnotist or obediently execute all commands.

A prerequisite factor in successful healing by this psycho-physical process is passivity and faith, a subjective faith, which is only obtainable upon partial or complete cessation of opposition, active and passive, of the waking consciousness. As the transcendental mind is the seat of the cosmic emotions, more than ordinary subjective development on the part of the physician would logically suggest a perfect condition for therapeutic measures, for then the transcendental mind of both would be *en rapport*, and telepathic communication would at once result with relief of pain or the cure of the disease.

Facts in hypnotism demonstrate the complete amenability of the subjective mind to the power of suggestion, making it obvious that any therapeutic suggestion from a physician would prove very efficient if in accord with instinctive auto-suggestion. By analytical reasoning we must infer from this that the subjective condition is essentially restorative, and since normal sleep can be converted into somnambulism, one of the deepest stages of subjectivity, we are again logically forced to admit the similarity of sleep and somnambulism, and that the latter is not due to disease but on the contrary heals directly through deep sleep and suggestion.

Healing the sick in ancient times was supposed to be due to divine aid exerted by means of "prayer, ceremonies, laying on of hands, incantations, amulets, talismans, rings, relics and images, and the knowledge of it was transmitted with the sacred mysteries." Modern science, however, guided by the spirit of truth in the garb of inductive reason, realizes that the lightest or deepest stage of hypnosis is due to a peculiar state of the nervous system induced by certain objective conditions, and like ordinary sleep is dependent upon an absence of sensorial impressions. A knowledge of this lead Brown-Sequard and other neurologists, to show that when one objective or sense-function is used to excess, the others become for the time being inhibited; and that continuous stimulation of one cerebral center would not only result in temporary inhibition of objective cerebration, but would ultimately culminate in a loss of sensorial consciousness and the development of trance or somnambulism.

In sleep the brain is in a state of repose, and as Durham conclusively demonstrates the cerebrum contracts and becomes pale and anemic. This anemia is, however, to be regarded as an accompaniment, and like the vascular state of any active organ, an effect rather than a primary cause.

Paracelsus understood and appreciated the laws of mind, for he said: "Whether the object of your faith be real or false, you will nevertheless obtain the same effects. Thus if I believe in St. Peter's statue as I should have believed in St. Peter himself, I shall obtain the same effects that I should have obtained from St. Peter. But this is superstition. Faith, however, produces miracles, and whether it be true or false faith it will always produce the same wonders." Faith, therefore, is an epitome of the law of suggestion, establishing at once a mono-ideaistic attitude of mind, removing and making impossible auto-suggestion contrary to the result desired. Belief or faith induces passivity through the prevention of antagonistic auto-suggestion, but is not in itself sufficient for the evolvement of the transcendental; for certain psychologic and physiologic processes are involved that necessitate attention with prolonged concentrated effort upon a single point, that inhibitory action may take place through over-stimulation of one sense-function. Thus faith is a potential factor of passivity and mental concentration, indispensable conditions for healing by the laying on of hands, for under these conditions only will the subjective mind rise from below the psycho-physical threshold of consciousness, and stand out boldly in all its manifest power to heal.

Schopenhauer says: "The phenomena under discussion are, at least from the philosophic standpoint, of all facts presented to us by the whole of experience without comparison the most important; it is therefore the duty of every learned man to make himself thoroughly acquainted with them. Then, however, will a time arrive when philosophy, hypnotism and natural science, in the unprecedented progress of all its branches, will throw mutually a light so brilliant upon one another, that truths will be apparent which can only thus be attained."

The great medical association of England and of continental Europe consider the phenomena of hypnotism worthy of close investigation. Every physician should make himself thoroughly familiar with its details, and if after careful and systematic research and experiment he finds it efficient, should employ it in the alleviation of bodily ills.

This can now be done without reproach, for the attitude of the profession is favorable, and the correlative advancement of other sciences precludes the possibility of ascribing supernatural agency to the accomplishment of seemingly miraculous facts.

DISCUSSION.

Dr. JOHN A. CUTTER of New York—Some eleven years ago, my mother was seriously sick with pneumonia. I was called in the night to help my father and in the course of our ministrations; he placed one hand on the small of her back and the other over the heart. He said he was endeavoring to confer force on her. There is such a thing as conferring force from one to another. To go into a room in which a patient is slowly dying, from cancer or some other serious chronic disease, and stay in that room but ten minutes questioning the patient and doing whatever is necessary, with me results in a loss of nerve force or whatever you might call it, which I distinctly realize after leaving the patient. There are people who guide and help one and there are others that irritate and annoy. My father has often said that the secret of success of many physicians of large practice but of very moderate education and scientific knowledge was because of their ability to confer force upon the patient, guide the mind and allow nature a chance to come in and effect a cure.

We might put in as a subdivision of this subject, the conferring of hope on a patient. I know that I have been able to stop pain simply by putting my hand on the place where the pain was. Now, the practical application of this idea is very broad, but I wish especially to call attention to the fact that the professional masseurs do more good by conferring force than by any special method of rubbing, kneeding, rolling or twisting of the muscles on which they lay particular stress. I have questioned patients as to their previous experience with masseurs and have learned from them that if they are manipulated in the morning or when the masseur is not tired, the séance will give the patient relief, but if the manipulation is done at night, after the masseur has had a hard day's work, he will not do the patient any good but is liable to do him harm, taking energy from the patient unto himself, because the patient has said that he has been distinctly tired after the rubbing when before he was fairly rested. Now, as scientific men, we should be willing to investigate all these things. Because we can not weigh or measure nerve force, because we do

not know what life is and because we have not the knowledge of the currents of electricity which are probably passing up and down and in and about the body. We must not neglect to learn all we can to give our patients the very best possible.

Dr. NATHAN S. DAVIS—It is true that the curing or attempting to cure diseases by the laying on of hands, prayers, charms, and much of what is now included under the term hypnotism, is of very ancient date. Indeed the further we go back in the annals of time the more exclusively do we find all human ailments attributed to good or evil spirits, gods or goddesses, and their cure sought by mental or spiritual influences. And through all the ages, apparently remarkable cures have been, and still are effected by the agencies alluded to. But I think the paper admits that all the diseases cured by such means were purely functional and not involving structural changes. That the mind of man, or the nerve centers though which mind is manifested, exerts a strong influence over the bodily functions both in sickness and in health every intelligent and observing physician will admit. Excite in the mind, confidence, hope and cheerful expectation, and you increase the depth and fulness of respiration, thereby imparting more oxygen to the blood and more efficiency to all the vital functions. Continuing these mental conditions with correct hygienic surroundings will result in the cure of many chronic functional disorders; while the reverse mental conditions will cause them to remain invalids indefinitely nothwithstanding the administration of many drugs.

I think all the phenomena of sleep and those conditions connected with sleep, are much better explained on the supposition that they result from incomplete quiescence of either the sensorium or of some of the nerves of sense, than by any theory of duality of brain and mind. When natural sleep is complete there is no evidence of dreams. But when it is incomplete or the degree of quiescence of the sensorium and of the nerves of sense is unequal, or there co-exists disturbance in some of the excito-motory nerve structures, then we have dreams or some of their allied phenomena. The parts of the brain suggested in the paper as the seat or organ of subjective mental activity and consciousness, i.e., the pons, medulla oblongata and cord have been amply demonstrated both clinically and experimentally to be the primary nerve centers of the vasomotor, respiratory, and other involuntary or excito-motory functions. Those centers are connected by commissures with the cerebral sensorium to which the primary impressions must be conducted to be consciously recognized. If stopped at the primary centers they simply return reflex and excito-motory influences capable of producing many of the phenomena mentioned in the paper; and if we include the numerous excito-motory nerve ganglia or cells on the spinal nerves, and in the cardiac and other internal structures, we can more rationally explain all the phenomena discussed without the assumption of duality of mind or duality of mental brain, than with them.

Dr. RANDALL HUNT—Unless a dual consciousness be admitted we can not hope to explain in a logical and intelligent manner the change in the physiologic measure of time necessary for the transmission of an excitation by the nervous system in the dreaming and waking states. Helmholtz and Fechner have proved this experimentally, consequently any assertion to the contrary has no argumentative value unless sufficient evidence is adduced to invalidate it.

The confused and fantastic content of recollected dreams unquestionably demonstrates only partial inhibition of the cerebral cortex and waking consciousness, but in somnambulism, where complete inhibition occurs, there is no recollection, and if the consciousness of both states was identical, recollection would exist because the subject of consciousness would be the same.

If the psycho-physical stage of somnambulism, dream, hypnotism and waking consciousness were the same, hypnotism, dream and somnambulism would be only a continuation of waking consciousness, and the remembrance of the material and figure of these states would be identical. The fact of a loss of recollection and difference in representation in the states of hypnotism, somnambulism and dreaming, argues a change of consciousness in these states and the normal waking state.

Recollection is essentially intellectual and cerebral, therefore somnambulism forces us to look for the center of true memory either in the sensory ganglia or pons, medulla and cord, or both.

If it is physiologically and psychologically true that the pons, medulla and cord are only reflex centers, we would be logically forced to admit that the cerebrum in sleep, dream, somnambulism and hypnotism responds automatically to impressions, exciting reflex action when the will is in abeyance or can not be exerted. If this were true the hypnotee would be unable to withstand immoral or criminal suggestion which is, according to Kingsbury, Hudson and Charcot, absolutely contrary to experience and clinical facts.

The eminent physiologist Heidenhain says, "the cause of the phenomena of hypnotism lies in the inhibition of the ganglion cells of the cerebral cortex," and if inhibited they can not act automatically, or otherwise, logically and physiologically suggesting another consciousness with its seat in a different part of the brain.

Prof. Laycock and Gall assert that emotion and instinct can be excited independently of consciousness and of the brain; in fact Dr. Laycock goes further and says, "there are phenomena, however, in favor of the doctrine that the medulla oblongata is the common sensory of all conscious states, whether they refer to corporeal processes or the purely encephalic changes associated with ideas.

Mind manifests itself through its threefold states of intellect, emotion and will, and it is striking to observe how the consensus of opinion among physiologists is that the sensory ganglia, pons and medulla are the seats of the emotions. Whether Brown-Séquard, Noble of Manchester, Prof. Cleland of Glasgow and other great physiologists are correct in stating that the medulla is necessary to the manifestation of mind, I leave the profession to decide.

RECENT PROGRESS IN MENTAL PHYSIOLOGY.

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BY E. P. HURD, M.D.

PROFESSOR OF PATHOLOGY AND DERMATOLOGY, COLLEGE PHYSICIANS AND SURGEONS, BOSTON, MASS.

NEWBURYPORT, MASS.

It is unquestionably true that this century has witnessed greater advances in the knowledge of mental physiology than all the ages that have gone before. The nervous system and especially the cerebrum were, prior to this century, almost a *terra incognita*. We may not know more respecting the properties of mind than our forefathers did, but we understand as they could not the conditions of mental action.

PHRENOLOGY.

The movement inaugurated by Gall and Spurzheim early in this century undoubtedly added a powerful stimulus to the study of mind. The doctrine of localizations in the brain then first was given formal statement. Although the body of teaching comprised under the name of phrenology was erroneous there was some truth which gave the system the success which it for a time attained. Attention was powerfully directed to the physical correlatives of mind and the so-called mental faculties were analyzed and defined with considerable precision. We now know that there is no such relation between faculty and organ as the phrenologists affirmed, but the modern investigator has been aided in the study of the true doctrine of cerebral localization by the hypotheses and mistakes of his predecessors.

THE EARLY PHYSIOLOGISTS AND THEIR SUCCESSORS.

The work of Bichat, in the first part of the century was highly advantageous to physiologic inquiry. He first defined the elementary tissues (his classification with some modifications being still in current use), and called attention to the vital properties of the tissues. This conception became fruitful in its application to the nervous system. He was the first to predicate sensibility of all the organs, which, he says, "form their vital character." In 1811 Sir Charles Bell first demonstrated that there are nerves of sensation and nerves of motion, and he roughly sketched motor and sensory localization in the spinal cord. The way was now open for other researches localizing function and

specifying properties in different parts of the nervous system.

The science of biology has sprung into being during this century, and as a result of perfected microscopes, the cellular structure of all organic and vegetable tissues has been revealed. The field of vision has been extended to the domain of the infinitely little. The truly functionating (parenchymatous) elements are groups of cells which, the more we study their marvelous properties, seem the more endowed with the attributes of intelligence. We may fairly compare the behavior of the leucocytes and other living cells of a part invaded by hostile bacteria to the actions of a colony of ants when their citadel is attacked by an enemy; and the true tissue builders of the organism may be likened to the honeycomb fabricators of the hive.

Since the discovery of protoplasm, it has been shown that even the cell is not the fundamental unit, but that the essentially living substance is independent of structure and endowed with the properties of nutrition, growth, reproduction and movements, apparently spontaneous. I shall not discuss the question whether there be any real spontaneity in the movements of the matter of life. Some (as Claude Bernard) insist that the seemingly independent movements of protoplasm are caused by the impact of forces in the environment.[1] On the other hand, Lionel S. Beale in his numerous writings claims the separate existence of a transcendental power, "vitality," as the agency upon which the composition, character, minute structure and action of all tissues and organs in every living organism directly depend. It is not derivable from or correlated with the natural forces, light, heat, electricity, etc. This is dualism pure and simple, a conception from which the scientific world has been steadily moving. It has hampered science in the past, and has been unfruitful of progress. All admit the mystery of life, and it is as great as the mystery of mind.

MIND, ONE ASPECT OF LIFE.

Prior to about the middle of the last century, the most vague ideas of cerebral physiology were entertained. Although the brain was held to be the organ of mind, the latter was not regarded as the function of that organ,[2] consequently the study of mind was not connected with the study of the nervous system.

Hartley, in 1748, made the first attempt to explain psychologic phenomena on physiologic principles. Locke's treatment of the subject is of the vaguest kind, although he had attained to a singularly correct biologic conception of man, whose identity (like that of the plant and animal) consists in "a participation of the same continued life by constantly fleeting particles of matter in succession vitally united to the same organized body."[3] Hartley was the first to speak of motions in the substance of the brain (called also by him "oscillations" and "vibrations") as concomitants of thought. Erasmus Darwin's theory is substantially the same as Hartley's, though he had a dim idea of psychology as based on the laws of life. On this basis Cabanis early in this century instituted his psychology. He first distinctly connected the operations of intelligence and volition with the origin of all vital movements. Life and mind were treated as correlative. The consequences were immediate. If mind was to be studied as one aspect of life, it must be studied through that inductive and experimental method which has reached the certain truths of positive science.[4]

No author has carried forward this conception as far and established it by such a wealth of fact as Herbert Spencer, whose "System of Psychology" has been an epoch-making book, profoundly affecting all subsequent psychologic writings.[5] In the light of the Spencerian philosophy, human psychology is only a part of animal psychology, both dealing with orders of phenomena to be studied under the head of gensral biology. Mind in the last analysis is resolvable into units of feeling, whose objective counterpart is a nervous shock or series of shocks occurring in the living protoplasm of a nerve center. This conception assimilates human to animal intelligence, and whether best explicable by the monist or dualistic hypothesis, is quite inconsistent with the assumption of any radical difference between the human and the brute mind. If the one needs an immaterial agency to account for its existence, so equally does the other.

In Spencer's system the inorganic comes first, then the lowest forms of vegetable and animal life, then forms of life that have a relatively developed mentality, and finally those that possess it in a high degree, like man.

If the chapter of inorganic evolution could be written, it would trace the development of compounds of matter of the simplest and most stable forms up to those highly complex and unstable compounds containing nitrogen, sulphur and phosphorus constituting the protoplasmic group. The gaps in this study can only partly be filled by a process of reasoning from the law of continuity. There is in the universe a constant redistribution of matter and motion, and these redistributions constitute the changes which we see; nothing new is introduced except what results from the redistributions. There is nothing in the evolved universe which did not exist potentially in the original nebula. The elements and forces which compose an organism existed previously as parts of other compounds. Everything has come into being through one method of evolution from lower forms. How is it with mind—with consciousness? When these first appeared was any new element added?

The consistent evolutionist denies that there has been any supernaturally interjected element. The hypothesis that there is any such element introduces confusion into his system. He may rightly rest in the agnostic position that we can know nothing of the ultimate nature of either mind or matter. He may adopt Spencer's thesis, that the unknowable manifests itself to us subjectively as consciousness and objectively as matter. Doubtless, as Boscovich, Faraday and Jevons believed, matter in the last analysis is simply force, *i. e.*, something immaterial, spiritual. Granting this, monism is the more logical doctrine. Everything has a transcendental side. Mind and matter have a common substratum. In its application to nerve centers, what is nervous shock on one side is

[1] Claude Bernard, Legons sur les phenomènes de la Vie, states: The movements are spontaneous only in appearance. There are always exterior agents foreign to the living organism which provoke active manifestations in living protoplasm. In the higher animals these stimuli generally act through what Bernard calls "the interior environment," *i. e.*, the circulating blood.
Lannessan, in his remarkable work (little known in this country): "Le Transformisme," defines life as "the sum of movements manifested by matter in that state of chemic composition and molecular aggregation which is the most complex of which we have any knowledge."
[2] The proposition that mind is a function of the brain must be taken with great limitations. See G. H. Lewes, Biographical History of Philosophy, Am. Ed., p. 603.
[3] Essay on the Understanding. New York, 1825, p. 220.

[4] G. H. Lewes: Biographical History of Philosophy, p. 604.
[5] Notably Maudsley, Taine, Ribot, Fiske.

feeling on the other. Consciousness is the correlative of the collective life of millions of cortical cells, each having an individuality and mode of feeling of its own. The proposition is incomprehensible, but it is not inherently absurd, as it is in accordance with all biologic fact. In all our mental life, the physical is so inextricably interwoven with the mental that by no analysis can we separate them. The application of this truth to the emotions is familiar to all. "The expression is not merely an external sign of the emotion, it forms an integral part of it. Even in a normal state where an expression is artificially produced, it gives rise to the corresponding emotion."[6] Bain (who was I believe the first to publish a text-book on the mind with an introductory chapter on the brain and nervous system), has shown this with a wealth of detail in his "Emotions and Will." Take, for instance, his description of the physical accompaniments of terror, and conceive, if you can, of this passion existing without those physical expressions.[7]

It is impossible to present here even a summary of that important part of Mr. Spencer's work in which he traces the correspondence of life and mind throughout the animal kingdom. He affirms that if evolution be true, mind can only be understood by observing how mind is evolved. If creatures of the most elevated kinds have reached those highly integrated and extremely heterogeneous organizations they possess through modifications upon modifications accumulated through an immeasurable past—if the developed nervous systems of such creatures have gained their complex structures and functions little by little; then necessarily the involved forms of consciousness which are the correlatives of those complex structures and functions must have arisen by degrees, as it is impossible to comprehend mental (as well as bodily) organization, without tracing its stages.[8] No one at the present day has done this work so well as Mr. Spencer, and to his "Principles of Psychology" I must refer the reader for further details. He shows that the most general definition which can be given of life—the maintenance of inner actions corresponding with outer actions—also applies to mind, that the degree of both varies as the degree of the correspondence, and that we pass from the physical to the psychical the moment we rise above the correspondences that are few, simple and immediate. "Regarded under every variety of aspect, intelligence is found to consist in the establishment of correspondences between relations in the organism and relations in the environment, and the entire development of intelligence may be formulated as the progress of such correspondences in space, in time, in speciality, in generality and complexity."[9]

Lastly, he shows that the classifications current in our philosophies of the mind can not be true. "Instinct, reason, perception, conception, memory, imagination, will, etc., must be either conventional groupings of correspondences, or divisions among the operations which are instrumental in effecting the correspondences."

THE NEW PHRENOLOGY.

There is no doubt that the doctrine of localization of functions in the cortex cerebri, as based on the discoveries of Fritsch and Hitzig, and especially David Ferrier, has forwarded the progress of mental physiology. The former teaching, sanctioned by the authority of Flourens, was that the functions of all parts of the cortex were essentially the same. The gray matter was inexcitable by ordinary irritants. Mind was regarded as a principle residing in all parts alike, and the destruction of limited areas of gray matter might not seriously impair the mental powers; experiments on rabbits and birds on which ablation of portions of the cerebrum had been performed, were alleged in support of Flourens' doctrine, and the celebrated crow-bar case was made to do yeoman service. "A limited part of the cerebral lobes," says Flourens, "suffices for the exercise of all their functions."

It need hardly be said that such views of cerebral psychology have not at the present day a single scientific advocate, and are virtually abandoned, so that they do not merit formal refutation. I may include in this reprobation the traditional belief that the brain is a mere machine played upon by "the mind."[10]

It was a surprise to the world when the doctrine of motor centers in the cortex cerebri was first enunciated—that a considerable area in the parietal lobes which had been assigned by the early phrenologists to certain faculties of the mind, was a part of the motor mechanism of the body. Broca had found the center of articulate speech in the posterior part of

[6] Binet and Féré: Animal Magnetism, p. 54.

[7] I can not refrain from citing (though in a note) the illustration given by Prince Kropotkin in the *Nineteenth Century* for July, 1897. The intimate correlation of the psychical and the physical is shown in conformity with the recent discoveries of Ramon y Cajal.

"Suppose that the skin of the right hand is irritated by a burn. The end ramifications of some nerve fibers in the skin at once transmit the irritation inward, to a ganglion cell located near the spinal cord. From it a nerve impulse is sent along another nerve fiber which enters the spinal cord and there envelops with its end branches the dendrons of some neuron. The central nerve system has thus been rendered aware of the irritation of the skin, and in some way or another it will respond to it. The nerve current, after having reached the cell of that spinal cord neuron, immediately issues from it along a nerve fiber; and if that fiber runs toward a striated muscle of, let us say, the other hand, our left hand may touch or scratch the burnt part without consciousness of that action being aroused; it is a simple reflex action. But the nerve fiber of that same cell may divide into two main branches, and while one of them runs to the muscle of the left hand the other branch runs up the spinal cord and reaches one of the big pyramidal cells of the gray cortex of the brain. The ramifications of this branch envelop the dendrons of the brain cell and transmit the impulse to it. Then we become conscious of the sensation in the right hand, and we examine the burn. However, the pyramidal cell in the gray cortex is connected, through its dendrons and fibers, with many other cells of the brain, and all these cells are also started into activity. But the big pyramidal cells, in some way unknown, are the recipients and keepers of formerly received impressions, and as they are stimulated associations of previously impressed images—that is thoughts—are generated. A familiar association between a burn and oil may thus be awakened, and we put some oil on the burn. At the same time the nerve impulse was also imparted to that chain of ganglia (the so-called vasomotor system), which is connected with the heart, the intestines and all other inner organs, as also with the blood vessels, the glands and the roots of the hair. And if the burn was severe, and very painful, the activity of the heart may resent it, as also the blood vessels; we may turn pale, shed tears, and so on.

Now, whatever hypothesis we may adopt to explain how an undoubtedly physical nerve impulse can be transformed into complicated psychic processes, each of which also ends in physical facts, it can now be affirmed that the paths which the nerve impulse follows, and the activity which it starts in a number of cells of the brain, spinal cord and ganglia, are hypotheses no more. The electric effects of the nerve impulse as it is transmitted along such and such nerves, have been measured; its transmission from this or that cell of the cord to these or those cells of the brain has been tracked step by step; nay, the activity of the stimulated nerve cells in the brain and elsewhere has actually been determined, and the effects of fatigue in nerve cells have been studied in detail. And when the anatomist maintains that an irritation of the skin will be transmitted in this way and not in another, to such cells in such cases, and start into activity such cells of the brain, this is speculation no longer. It is a fact of natural science, firmly established, and verified in different ways by a mass of materially controlled observations."

[8] Principles of Psychology, Vol. I, p. 292.

[9] Loc. cit., p. 385.

[10] There is a sense in which these views are correct. Munk, in answer to the question, "Where is the seat of intelligence?" replies (and in this answer we see how far the new psychology has diverged from the old): "Intelligence has its seat everywhere in the cerebral cortex and nowhere in particular. It is, in fact, the sum or resultant of all the images or representations derived from the exercise of the senses. Every lesion of the cortex alters the intelligence more or less profoundly, in the ratio of the extent of the lesion. This it always does by the loss of those groups of images or representations, simple or complex, whose seat is the cortical territory injured. The intellectual trouble will be definite: 1. If the perceptive elements are destroyed; 2. If there remains no more substance which can become the seat of the functions lost. Blindness, deafness, psychical paralysis, complete or incomplete, of one part of the body entail greater or less contraction of the field of intelligence." Soury, Fonctions du Cerveau, page 117.

the third left frontal convolution. Ferrier found this center to be a part of the motor zone, which is formed by the juxtaposition of several centers, each presiding over the motion of a member, or of a muscular group on the opposite side of the body.

The topography of the motor or cortical centers in man is well demonstrated by the anatomo-clinical study of motor paralysis of cortical origin.[11] These paralyses are extensive or circumscribed according as the lesions of the cortex on which they depend are considerable or inconsiderable in extent, and they affect this or that part of the body according to the precise point in the motor zone in which the lesions are situated.

These are the motor centers (*libero-motor*) of actions properly classed as voluntary and conscious; and even *ideo-motor* actions, originating in the cortex through awakened sensory images, find here their mechanism of reflection.

Here is the highest plane of transit of the sensory into the motor. Here are the centers where impressions not disposed of in the lower ganglia are finally reflected. If life and mind are the adaptation of inner relations to outward changes, here is the workshop where the finer, more delicate adjustments are made which bring the individual into most complete harmony with his environment. For these ganglia are in the closest connection with other ganglia (those of visual and auditory perception, etc.,) in which are registered the experiences of a life time and during the psychic life of the individual they are responsive only to mandates from these higher centers. The infinitely numerous and varied neural communications between ganglia make possible the most complete functional solidarity.

The cells of the motor area (Rolandic region) register motor memories; they are *libero-motor* (Herbert Spencer).

The optic lobes in the lower vertebrates and their intra-cerebral expansions have a functional importance commensurate with their preponderant size, and although in man the corpora quadrigemina are relatively small, the cerebral expansions of the visual nerve apparatus occupy the occipital lobes and a part of the parietal (angular gyrus), in other words these parts of the hemispheres are appropriated to sight memories. Their destruction involves the loss of a wide territory of mind, all knowledge acquired by the visual sense. For it is now known that memory is a material record, "we may in fact assimilate the fixation of memories to an iconographic act, if the complexity of structure of the encephalon did not interpose an obstacle to such a schematization."[12] "To say that the cortex cerebri is a sensitive photographing plate on which are fixed the images of the external world is no longer one of those metaphorical formulæ which are employed to express empirically what can not be scientifically demonstrated."

There is a sense in which the term images as applied to the cortical memories is correct, but it should not be forgotten that we have to do here with vital laws, not physical.

If impressions may be "graven" on the cells of the visual centers, they may be weakened by fatigue or anemia or obliterated by disease, and instances are on record where whole groups of visual memories have been blotted out by softening while the memories of other senses are left intact. The condition of the subject is truly deplorable, for he can no longer recognize objects, and all that he has learned by sight has perished. The distinction of partial memories, so much insisted upon by Ribot has been established beyond dispute. Charcot has devoted to this subject an interesting lecture in the third volume of his Lectures on the Diseases of the Nervous System (Leçon xiii). He gives the particulars of a case of loss of the mental vision of objects, forms and colors, coming on suddenly in a subject noted for great intellectual activity, but especially for the strength of his visual memory. After an attack, which seemed to be of the nature of a limited embolism, he lost his visual memory of forms and colors, and was obliged to have recourse to other forms of memory (the auditory, tactual, etc.) which were unimpaired. The "interior vision had completely disappeared." Charcot concludes his observations of this case by saying that, "It can not now be denied that the possible and actual suppression in numerous instances of an entire group of memories, of a whole category of commemorative images without the participation of other groups or categories is a capital fact in pathology as well as in cerebral physiology. It leads necessarily to the admission that these divers groups of memories have their seat in certain determinate regions of the encephalon, and adds another proof to those already existing that the hemispheres of the cerebrum consist of a certain number of differentiated organs of which each possesses its proper function while remaining in the most intimate connection with the others."

The visual word center whose suppression gives rise to word blindness is in the angular gyrus. Lesion of this center is generally accompanied by hemiopia by involvement of the common visual center situated in its vicinity. Dejerine, who locates word blindness in the angular gyrus, thinks that lesion of this center always connects with it agraphia, writing being but the copy of visual word images evoked mentally,[13] (See in opposition to this exclusive view Bastian in London *Lancet*, April 10, 1897, page 1012.)

The auditory word center whose destruction causes psychical word deafness is seated in the middle part of the first left temporal convolution.

Ferrier, Wernicke and Munk agree in localizing the center of audition in the temporal lobe, particularly in its upper portion; the first and second temporal gyri. This is the seat of sound perception, destruction of which entails loss of the memory, and consequently of the comprehension of words. There are now quite a number of cases on record in which the loss of word memories was consequent on softening of this center. Many cases have been recorded in which the patient's speech has been so disordered that he could scarcely say more than three or four connective words, and could perhaps utter no nouns, yet when a book is placed before him, he is capable of reading aloud correctly and with ordinary facility.[14]

Regarding the centers of smell and taste, it seems demonstrated that these are located in the sabiculum cornu ammonis, and in the hippocampus. We, however, lack positive data in this regard. It is also in

[11] Vide Charcot: Centres Moteurs Corticaux, p. 193. Paris, 1875.
[12] Bressaud: Traité de Médecine, Charcot, etc., Paris, 1895, p. 6.

[13] See "Illustrative Cases of Aphasia," by Byrom Bramwell, Case 1, p. 796, In Lancet for March 20, 1897. He reports a case of agraphia with almost complete word blindness due to a gumma in the region of the left angular gyrus. This writer does not, however, admit that all cases of word blindness are accompanied with agraphia.
[14] Bastian, in London Lancet, April 10, 1897, gives notes of three such typical instances.

the hippocampus that Ferrier locates the centers of tactile sensibility, but we require more definite knowledge on this point. There is good reason to believe that in man the motor areas of the cortex contain also the centers of cutaneous sensation.[15] The frontal lobes undoubtedly make part of the sensitive or sensori-motor sphere of the cortex cerebri. They are, according to Ferrier, inhibitory motor. Electric stimulation causes no motor manifestations; their removal produces no motor paralysis, but causes a form of mental degradation which may be reduced in ultimate analysis to loss of the faculty of attention (Ferrier, Functions of the Brain, page 288).

Removal of these lobes also produces a peculiar change of character; animals become morose, irritable and violent, and similar changes of importance have been noted in them after serious injuries of these lobes. Removal of the occipital lobes seems more directly to enfeeble the intelligence, because, as Soury shows, the posterior cerebra have more to do with sensibilty, and in the event of their mutilation, "the impossibility of inhibiting the centripetal irritations and of determining muscular movements co-ordinated in view of a useful end will give to the animal the aspect of a creature becoming demented.[16] The anterior cerebra have a more strict anatomic relation with the motor apparatus; the posterior with the organs of sense. As long as these two cerebral regions are intact, the centrifugal currents of the muscular innervation may undergo an arrest, as well as the centripetal currents coming from the organs of sense. The cerebral reflexes enter in play, and the final reaction positive or negative, always results from the conflict of the psychic forces. But in the animal whose front brain has been removed, there is no longer anything to oppose the liberated currents of motor energy.[17]

"Man," says Ferrier, "is not merely a passive or receptive organism capable of registering impressions in the form of sensory ideas or feelings, but also an active or executive organism, possessing the power of varied and complex forms of motor activity. These motor activities called into play by definite feelings or sensations, actual or revived, constitute volitional movements, and the organic cohesion formed between the sensory and motor centers persistently enduring in these centers is the physical basis of our volitional acquisitions in all their manifold range and complexity."[18]

In accordance with these views, we can only regard intelligence as the resultant of all the images or representations derived from the perception of the senses. Every lesion of the cortex alters the intelligence, the more profoundly the greater the extent of the lesion; this it effects by the loss of these groups of images or representations, simple or complex, which have for their substratum the cortical territory diseased or destroyed.[19]

The familiar truth, *Nihil est in intellectu quod non prius fuerat in sensu* (there is nothing in intellect which was not previously in sense), has received striking confirmation from recent discoveries in mental physiology. What clear notion is it possible to form of mind apart from these stores of images that have come in through the special senses? Reflection, imagination, ideation, discrimination are only possible as these images are awakened and brought into simultaneous intercommunication through that wonderful network of neural connections which exist throughout the cerebrum. But many of these organized acquisitions antedate the experience of the individual, and are a product of ancestral experience.

The human brain may be regarded "as an organized register of infinitely numerous experiences received during the evolution of life, or rather during the evolution of that series of organisms through which the human organism has been reached."[20]

The physiologist of today is perhaps as far as his predecessors from a solution of the problem of consciousness. Consciousness is doubtless a primordial fact of ganglionic nerve activity under certain conditions. These conditions are now tolerably well known. It is not an activity that can long be sustained without interruption. It seems particularly to be associated with the disintegration of nerve element. Some writers, notably Herzen, regard it as the fervid glow of the sensorial centers. The illustration will answer our purpose, the qualification being made that we are regarding only the objective aspect of the subject. In this fervor all the elements of the cortex participate with a greater or less degree of intensity, by reason of that cohesion of neural groupings which constitute a solidarity of the brain functions.[21]

1. "Impressions are resuscitated or brought into consciousness in proportion to the amount of molecular change in the brain" (E. D. Cope). This statement is in conformity with Herzen's investigations (See "Le Cerveau et l'Activité Cérébrale," Part III.)

2. Events are resuscitated in proportion to the intensity with which they are impressed on our consciousness at the moment when they occur. This is a universal experience, and according to Cope is to be traced to the different degrees of molecular changes produced in the brain by the respective impressions. Cope, from whom I quote, gives appropriate illustrations. The facts of inherited memory are; that upon the appropriate stimulus being presented, as the cry of a hawk, a part of the impression made on previous generations of chickens, *fear*, is resuscitated in consequence of inherited peculiarity. The phenomenon is precisely that which occurs in the life of every single animal. Reminiscence is the bringing of mental states into consciousness.

3. Consciousness is dependent on a certain normal waking state of the cerebrum and integrity of the cerebral substance.

4. Consciousness is not coextensive with mind. The contrary was taught as a psychologic dictum by Sir William Hamilton, but it is not correct, nor is it altogether true to speak of mental phenomena gener-

15 See a paper by Dr. Charles L. Dana, in the Journal of Nervous and Mental Diseases, October, 1888, in which this subject is discussed from recent data.

16 Soury: Les Fonctions du Cerveau, Paris, 1892, p. 136.

17 Loeb, cited by Soury.

18 Functions of the Brain, p. 266.

19 Munk (cited by Soury).

20 Herbert Spencer, loc. cit., p. 471. "Les perfectionnements ainsi obtenus dans une suite de générations finissent par devenir héréditaires et par faire partie des qualités de la race. Que de sentiments naturels aujourd'hui chez l'homme civilisé ne sont que des resultats d'une éducation continuée de générations en générations pendant de longs siècles." Vulpian, Physiologie Comp. du Système Nerveux. The French physiologist has here brought out the same truth as is advanced above.

21 The following passage is from Herzen, "Le Cerveau et l'Activité Cérébrale," Paris, 1887:

"We are conscious in the waking state, unconscious when we sleep soundly; this is a first rough indication of the bond which unites consciousness to the disorganization of the active elements. I shall show further on that this intermittence subsists in each central act taken separately. The brain may, in fact, be compared to a room furnished with an immense number of gas-beaks, but lighted only by a number relatively small and relatively constant of illuminated beaks, which are not always the same; on the contrary they change at each instant; as fast as one is extinguished others are lighted up; all are never illuminated at the same time; at times all are extinguished."

ally as "states of consciousness." Mental power, as Maudsley well says, is organized before consciousness appears, and it is subsequently regularly modified as a natural process without the intervention of consciousness.[22] Maudsley elaborated this fact with considerable completeness many years before the valuable contributions of F. W. H. Myers and Dr. Osgood Mason on the "Subliminal Consciousness" were published. Dr. Carpenter forcibly states the same truth in her "Principles of Mental Physiology," published in 1874. The subject has also been well treated by Dr. Laycock and by Dr. Oliver Wendell Holmes.

5. The process of association of ideas goes on in the brain independent of consciousness and the assimilation or blending of similar or different ideas is in no way under the cognizance or control of consciousness.[23]

If consciousness is the highest form of cerebral activity, embodying primarily present impressions of sense, and secondarily the residua of past impressions (the results of individual and even racial experiences) with the feelings and emotions belonging to those experiences, it follows that the character and personality of the individual can not find expression without consciousness; in other words, the individual when under the domination of subconscious or unconscious states is an automaton rather than a rational man. This truth has been recognized in all ages; a man is only responsible for what he does consciously.

Doubtless trains of thought can go on without consciousness; we have evidence of this in our dreams, and in hypnotism. It is possible for subconscious states or groups of ides to become "dislocated" and form a second personality. We find remarkable instances of this kind recorded in "Maladies de la Personnalité" by Ribot, and in Janet's "Automatisme Psychologique," and later works which deserve careful study. Hypnotism artificially arouses in the subject a second personality by paralyzing or inhibiting in some mysterious manner the upper consciousness.

I am aware that extraordinary claims have been made for hypnotism, but really nothing has ever been elicited from hypnotized subjects that was not before in their cerebra as parts of their stored-up acquisitions obtained through the channels of the senses. Again we say: *Nihil in intellectu quod non prius fuerat in sensu.* The most that we can concede is that in some phenomenal cases there may have been a preternatural exaltation of certain senses so that the subject became in some way cognizant of influences at a distance.

As for "mind reading," I have no explanation to offer; I await sure proof that the fact exists. The stores of "memory images" in the cortex cerebri are not legible characters nor even hieroglyphics to be read by experts, but simply cell modifications, with their subjective counterparts.

We should be slow to adopt the conclusions of Myers, who has written profoundly of the "Subliminal Consciousness," in the Proceedings of the Society for Psychical Research. A vast amount of assertion is made on insufficient authority. Myers' conclusions may be in harmony with the old psychology; they can not be reconciled with the new. If the views of some of these men of the Psychical Research Society are true, we must give up doctrines which are the necessary resultant of the inductive study of mind of the past hundred years. If Mr. Myers is right, we have learned nothing from the method of concomitant variations or the clinico-pathologic method based on the modern doctrine of cerebral localizations. This is no reason why we should reject proved facts, but it is important that we should weigh assertions and demand the most complete proof.

Dr. R. Osgood Mason has lately published a book entitled, "Telepathy and the Subliminal Self," which contains much that is simply as incredible as the prodigies which Suetonius describes attending the death of Julius Cæsar, and is not better supported. The order of phenomena of which he writes is quite familiar to us through the claims of spiritualists, who base their beliefs on just such "facts." Modern spiritualism has been very thoroughly investigated and found wanting. I need only refer to the labors of the Seybert Commission and to the English Society for Psychical Research, which has done good work in exposing frauds posing as mediums and clairvoyants. The mediums of this country are almost without exception shallow impostors and charlatans banded together to help one another and to deceive the public. Prof. R. Hodgson virtually affirms this as the result of his labors in the United States in behalf of the Society for Psychical Research.[24]

I am certain that the psychology of the future will not accord as much importance to the "subliminal consciousness" as does Dr. Mason. To him it is an unknown quantity of monstrous proportions, capable of all knowledge, past, present and future. Rather would we take the view of Janet, that it is the weaker self. "How far this splitting up of the mind into separate consciousnesses may exist in each one of us is a problem. M. Janet holds that it is only possible where there is abnormal weakness and consequently a defect of unifying or co-ordinating power. A hysteric woman abandons part of her consciousness because she is too weak nervously to hold it together. The abandoned part meanwhile may solidify into a secondary or subconscious self. In a perfectly sound subject, on the other hand, what is dropped out of mind at one moment keeps coming back at the next. The whole fund of experience and knowledge remains integrated and no split off portions of it can get organized stably enough to form subordinate selves."

This view of the pathogeny of the "second personality" I have given in the exact words of Professor James.[25] It is the view becoming more and more current among physiologists. The individual who is subject to these changing phases of personality, or who can assume them at will for purposes of gain, professing to be under spirit control is, like the hysteric or insane person (there are some forms of insanity in which the mental malady is a simple change of personality), a person of weak and depraved cerebral tone and stamina, a neurasthenic or a degenerate. It is folly to attribute to such weak-minded, depraved or degenerate subjects superior knowledge and insight and consult them on matters of the utmost moment, as is done by many. Science has in the past throttled superstition and will continue its beneficent mission. Spiritualism is based on old and obsolete views and must perish as men learn the new science of mind.

Let us defeat the Antivivisection Bill!

[22] Maudsley, Phys. and Path. of Mind, Am. ed., page 15
[23] Maudsley, loc. cit.

[24] See "Vampires of Onset," by John Curtis of Boston, for further proof. Mr. Curtis writes: "Nothing has come from spiritual or psychical societies of the least value to the world and all interest in them is fast dying out.
[25] Psychology, vol. i, p. 210.

A COMPARISON OF THE ANATOMY AND THE FUNCTIONS OF THE CEREBRUM AND THE CEREBELLUM.

Presented to the Section on Physiology and Dietetics, at the Forty-eighth Annual Meeting of the American Medical Association, at Philadelphia, Pa., June 1–4, 1897.

BY WILLIAM FULLER, M.D.
GRAND RAPIDS, MICH.

In order to understand the anatomy and the connections of the cerebrum and the cerebellum, it will be necessary to present a cursory view of the general structure of the central nervous system. For the purpose of description it will be advantageous to divide the cerebro-spinal axis into three portions, which may be compared with each other by similarity of parts, though differing in their arrangement. The three divisions of the axis which I shall make are, the spinal cord, the cerebellum and the cerebrum. Each of these parts is divided into lateral halves by a median fissure. The lateral halves are united in the median line by a commissure; each portion encloses a cavity or ventricle which is continuous with that of the others, and each is composed of gray matter, of motor and sensory function, with commissures of white matter extending between the gray masses, or the nerve centers. The gray matter of the spinal cord is invested by the white columns of the cord, while in the cerebellum and cerebrum the gray matter or ganglia are everted, and the white substance enclosed. The crescent-shaped gray columns of the spinal cord are its inverted hemispheric ganglia, and the reticulated column by which these are immediately invested, corresponds to the corona radiata of the cerebellum and the cerebrum. The longitudinal white columns of the spinal cord are seven in number, are continuous with certain tracts of the cerebellum and the cerebrum, and may therefore be traced upward into these parts, and associated into general systems, by which method of study an understanding of the whole structure will be reduced to the greatest simplicity. Disregarding the direction in which the nerve impulses are propagated, we will begin in each instance with a column of the spinal cord and proceed upward, in order to avoid confusion in the anatomic relations. We will make use of the singular number in most cases, since it will be understood that each half of the axis is like the other.

1. The motor tract: The crossed pyramidal tract unites with the direct pyramidal tract of the opposite side of the cord to form the opposite pyramid of the medulla oblongata. The anterior pyramid of the medulla passes into the pons Varolii, is there connected with one side of the ganglion of the pons, which is the external basal ganglion of the lobe of the cerebellum opposite to that half of the pons. The pyramid is continued through the crusta of the crus cerebri and the middle portion of the internal capsule and lenticular body, to the motor area of the hemisphere. The impulses propagated along this tract are downward, and are derived from the hemisphere of the cerebrum, and the opposite hemisphere of the cerebellum.

2. The ocular reflex tract begins below in the fundamental root zone of the spinal cord and, becoming compressed at the upper part of the medulla oblongata between the anterior pyramid, the olive and raphe, escapes in the pons Varolii to form a flat band in front of the fillet and, pursuing an upward and outward direction to the corpora quadrigemina, is continued through the brachia and the geniculate bodies to its connection with the optic tract.

3. The fillet tract or the sensory tract of Gower: This tract commences below in the anterior root zone of the spinal cord, passes upward to the pons Varolii, where it lies behind the olivary fasciculus, and forms the middle layer of the fillet with which it is continued upward internal to the crusta, which it crosses in an oblique direction to reach the frontal convolutions of the cerebrum. This tract is augmented in size as it passes upward by accessions from all the sensory ganglia and, with the large mass of fibers derived from the thalamus, this system forms the anterior portion of the internal capsule of the cerebrum. The probable function of this tract is to form a direct communication between all the sensory ganglia with the seat of consciousness and intellect in the anterior lobes of the brain.

4. The cerebello-spinal tract: The direct cerebellar tract of the spinal cord connects the cerebellum with the vesicular column of Clarke. The function is supposed to be trophic.

5. The organic sensory tract: Beginning in the posterior root zone of the spinal cord, it is interrupted in the medulla oblongata by the restiform ganglion, is continued upward to the cerebellum by the restiform body entering the corpus dentatum, or internal basal ganglion of the cerebellum, and to the cerebrum through the processus, red nucleus and thalamus to the occipital and temporal lobes of the hemisphere, which is the seat of the memories. It is probable that the impressions received by this tract are co-ordinated by the cerebellum, and organized into memories in the cerebrum. The region of the memories in the cerebrum is associated with the fillet system and the frontal lobes by means of the great longitudinal commissures, the import of which is, that the present impressions received through the fillet system of fibers just mentioned are thus associated in the intellect with the organized impressions of the past which, as I have before stated, are located in the posterior and temporal lobes of the brain.

6. The respiratory reflex tract is formed by the posterior median columns of the spinal cord which, terminating above in the clavate nuclei, are through these bodies connected with the centers of the sensory respiratory nerves.

If we add the speech tract to those above described, it will be observed that we have included almost the entire cerebro-spinal axis into four short and into three general groups or tracts. For our present purpose we may omit the former groups, and regard only the latter, viz., the motor tract, the fillet or direct sensory tract and the organic sensory tract. The cerebrum is connected with all three of the latter tracts but the cerebellum is not associated with the fillet, being devoid of consciousness and intellect, but with the other two tracts only, viz., the motor and the organic tracts. The parts which enter into the structure of the cerebrum, or into the cerebellum, are the internal capsule and basal ganglia, the transverse commissures, the corona radiata and the hemispheric ganglia, a comparison of which several parts will now engage our attention.

The internal capsule of the cerebrum is composed of three distinct parts: an anterior portion which is distributed along with the longitudinal commissures to the frontal lobes of the hemisphere, and is receptive in function; a middle portion, derived from the

parietal or motor area, and is motor in function; and a posterior and inferior portion, derived from the internal basal ganglia and distributed to the occipital and temporal regions of the hemisphere, the function of which is sensorial and organic, and which therefore contains the memories. The internal capsule of the cerebellum also contains three parts, viz., the restiform body, which connects it with the spinal centers; the processus, which connects it with the opposite cerebral hemisphere; and the deep layer of the transverse fibers of the pons Varolii, which connects it with the ganglion of the opposite side of the pons Varolii and the opposite motor tract of the cerebrum. The latter portion of the cerebellar internal capsule is its motor tract, which therefore decussates with its fellow in the middle line of the pons Varolii, in order to reach the motor tracts of the cerebrum previous to the decussation of the latter in the medulla oblongata, which supposition appears to be amply demonstrated in a hemimicrocephalic specimen in my possession, as well as from the consideration of the physiologic probability.

The restiform body and the processus both belong to the organic sensory tract and are continuations of the same. The internal basal ganglia of the cerebrum are sensory, and the external basal ganglion, or lenticular body, is motor in function, and each is connected respectively with the sensory and the motor tracts before described; their names indicate their relation to the internal capsule. So likewise the basal ganglia of the cerebellum are called internal and external, and are correspondingly sensory and motor in function. Its internal basal ganglion is the corpus dentatum, in which the restiform body terminates and the processus takes its origin. The external basal ganglion of the cerebellum, as before stated, is within the opposite half of the pons Varolii, being thus displaced to be associated with the opposite motor tract of the cerebrum, with which its function is allied. The corpus callosum of the cerebrum is a broad band of transverse fibers which unites its opposite hemispheres, and its analogue in the cerebellum is the superficial layer of the transverse fibers of the pons Varolii. The correspondence between the corona radiata and of the hemispheric ganglia of the cerebrum with the same structures of the cerebellum are sufficiently evident that they only require to be mentioned.

The size of the cerebellum relative to that of the cerebrum in different brains is worthy of note in reference to the effect upon the character of the individual. A large cerebellum is associated with a large development of the nutritive functions, and commonly with the existence of great force of character. Men thus endowed occupy the first place in the public estimation, while those of intellect occupy the subordinate position of advisers. The intense desires originating in a large cerebellum are not obstructed by the contracted foresight of a small cerebrum, and on the other hand a large cerebrum often magnifies the difficulties which lie in the path that leads to success. The man who is well balanced by a due proportion of these masses is happily constructed.

The above observation is supported by a comparison of several brains in my possession of persons with whom I was well acquainted in their lifetime, and I think that common observation will lead any one to the conclusion that a large abdomen is a stronger indication of greatness than a great head.

This leads to a consideration of the relative functions of these portions of the brain. We have observed that the cerebrum is built upon those tracts of sensation one of which furnishes it with material for direct perception, and the other organizes within its cells not only the impressions of past experiences, but perhaps also the inherited tendencies of a former generation. These are associated by means of the longitudinal commissures of the brain and the conscious judgments, ever varying with each successive stimulus, are reflected upon the motor tract in obedience to the mandates of the will. The activities of the cerebrum are those which produce sudden and active change of the organs of motion, in order to accommodate the individual to his environment. The activities manifested as the result of cerebral disease are those of mental disturbance, chorea, athetosis, etc. The lateral masses of the cerebellum are connected wholly with the organic sensory tracts and with the motor tracts of the opposite cerebral hemispheres. Each hemisphere of the cerebellum is directly attached to the same side of the spinal cord and receives impressions from the same side of the body to which it belongs; its motor tract crosses over in the pons Varolii, but is returned to the same side of the cord at the decussation of the pyramids of the medulla, in which the arrangement of the cerebellum differs from that of the cerebrum. It is a mystery which surpasses my capability of solution, why the tracts leading to the cerebrum are crossed. My present impression is that it is the function of the cerebellum to co-ordinate the nutritive functions of the body, and as the mental states of feeling, indicated by desires and passions, depend largely upon conditions of the organic nutrition, it is therefore very probable that the immediate support of the feelings of the mind rests upon conditions within this organ. This is the opinion of Laycock, who thinks that the cerebellum is virtually a great sympathetic center, and thus sustains about the same relation to the sympathetic system as the cerebrum does to the cerebro-spinal system, which I am inclined to accept. The movements produced by the cerebellum, if this theory is true, correspond to changes of organic nutrition and must necessarily be slow, and are manifested externally by attitude and such expression as one can read upon the countenance of an individual in a state of rest. To sum up in a general comparison, I should say that the cerebrum is the brain which represents a knowledge of the world, while the cerebellum represents the physical condition of the man.

It is not to be expected that I should give a complete exposition of the anatomy of the brain in the short time allotted to the reading of a paper, but I have seized upon this opportunity to express what I believe to be the only proper and useful method of studying the central nervous system. The study of the anatomy of the central nervous system should be prior to the investigation of function, for without the aid of anatomy all attempts toward the determination of function, of localization and diagnosis are futile.

Oblique Incision in Sectio Cæsarea.—Fritsch finds that there are many advantages in favor of an oblique incision of the fundus, parallel with the vessels. He recently practiced it and found the entire operation only required twenty-nine minutes; the fetus was extracted with ease; the hemorrhage was very slight and stopped after the removal of the placental sinus, without compression of the cervix. The abdominal incision can be made higher up, thus avoiding danger of hernia later. The operation was remarkably clean. No blood entered the abdominal cavity.—*Cbl. f. Gyn.*, No. 20, 1897.

THE PHYSIOLOGY OF RIGHT- AND LEFT-HANDEDNESS.

Presented to the Section on Physiology and Dietetics at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

BY GEO. M. KELLOGG, A.M., M.D.
CHICAGO, ILL.

Much as this subject has been discussed, it does not seem to have been approached from the right point of view.

The young infant is in evidence, whose manifestations and peculiarities have been entirely overlooked. First, there is no asymmetry of body or function in early infancy. The child uses its two arms, legs and hands equally well. If there is any heredity of one-sidedness, it does not appear. The first day of life one thing is especially manifest. Beyond all other parts of the body, the hands show greatest development in function. Flexion and extension of fingers, hands and arms are wonderfully perfect and truly bilateral. The first day of infant life the grasping power of the hands is extraordinary. If permitted to clasp a pole with both hands it does so with firmness and will easily sustain its entire weight for a prolonged period. All other parts of the body show comparative weakness and uncertainty of function. This indicates that the hands are developed early, so that the child may become acquainted with its surroundings. The extraordinary clasping power of the hands has amused even the evolution philosophers, who have presumed to declare it a reminiscence of bestial prehensility of claw or tail. However, it is a distinctly human trait. The hands are alert and well developed to feel their way into the world. The sense of touch comes first. Our hands are the first teachers of the properties of things, of roughness and smoothness, of heat and cold, of distances. All these as results of sensation are recorded in the brain through what we call sensory nerves. These nerves or conductors pass up from both sides to the posterior columns of the cord and through the medulla oblongata to each brain.

In the medulla oblongata a peculiarity of organization appears. The nerves from the right side pass, in greatest bulk (about 90 per cent.) to the left cerebrum. From the left side of the body 90 per cent. pass to the right cerebrum, while a small portion (about 10 per cent.) pass straight or uncrossed to the cerebrum of their own side. Thus each half brain is functioned to control both sides of the body, but with great preponderance the left cerebrum controls the right side of the body and the right cerebrum the left. If both sides of the body were used exactly alike the two brains would receive equal or uniform records of sensation. The same is true of the motor or efferent nerves. These also cross in the medulla oblongata from the left to the right side of the body and from the right to the left side in a similar disproportion. If each side of the body, through the hands, was trained exactly alike, the same records or memories of sensation and movement would be printed on the cerebral cortex of each brain. The two brains would become as ambidextrous as are the two eyes, which have an exactly similar crossing of nerve fibers in the optic commissure, whereby the eyes either together or singly carry to the sensorium the same impressions. It needs but little argument to show that were the two eyes separated from each other for the first few years of life, the habit of one-eyedness would become established, and they would never learn to act coincidently.

"Custom alone can overcome nature," says Bacon Have we not reason to suppose that nature, as evidenced in the anatomy of the body and the nervous system, may be defeated by a convention or custom established and persisted in from the infancy of the race? There is no animal, mammal at least, which is not perfectly ambidextrous. At least I can find no evidence of one-sidedness, save in man. This habit seems to have been established in early ages, probably before the historical period. The first occupation and duty among men was to fight and kill each other, for which purpose they desired one stronger hand to wield the club, spear and sword, while the left hand was relegated to carry a shield, and by custom, superstition and fancy it has persisted ever since. It is the exceptional parent, to this day, that neglects to train the child to right-handedness. Perhaps no mother or conventional nurse ever fails to place an object for the infant to clasp save in its right hand. That right-handedness is not natural, however, is evidenced by the oft-repeated left-handedness observed among us.

The left-handed habit is doubtless started in spite of the watchfulness of the parent during the critical period of babyhood, after the seventh month, perhaps on account of a burn, a strain or hurt of the right hand. The child at once brings the left hand into use, and in a few days, weeks or months the left hand habit becomes established with such force as to discourage the parent. All efforts weakly persisted in fail to correct it.

In the most primitive condition of man, before the custom of warring with each other existed, man as a hunter did not use the sword and shield. Perhaps then the two hands were brought equally into play. One or two authors have contended that early man was more ambidextrous than we; however, it seems impossible to confirm this. Among the early Hebrews the soldiers of the tribe of Benjamin were trained to left-handedness and the ancient Jewish script was from right to left. However, right-handedness has been in vogue through all the historic period. Left-handedness was in language equivalent to awkwardness—to the wrong as opposed to right (*droit*). The left was the weak, evil or sinister side. Men spoke of the "bar-sinister" "born on the left side of the blanket." It was the unlucky side, and the superstition of man became an early sponsor of qualities attributed to the left side. The ancient augurs observed as unfavorable the flight of birds to the left.

The importance of ambidexterity may be readily concurred in the increased capacity for labor obtained thereby, to the respite afforded to one hand by the use of the other, and the instant substitution of one hand for the other in case of injury to or loss of its fellow. I have known many cases of partial ambidexterity among mechanics and others, who could use either hand to saw and cut with, or draw a nail. Such were always proud of the accomplishment and realized its great advantage.

I have never seen but one case of complete ambidexterity. This was the late Alexander Mott, M.D., of New York, who used either hand in writing and the most delicate dissecting, in which his skill was marvelous. He told me he was always ambidextrous; that his father (the celebrated Valentine Mott) said, "My boy must succeed me in practice and I shall see

to it that he has two good hands instead of one, like his father." This case shows the practicability of effecting perfect ambidexterity by careful training.

Over a century ago Dr. Franklin wrote a short article for the French encyclopedia in which he personified the left hand as the neglected member and remonstrated against the absurdity of the conventional one-sided body.

Seventeen years ago Brown-Séquard came to this country and delivered his lecture on the "Dual Brain" in Washington, Philadelphia and Boston, in which he warmly urged the training of children to ambidexterity, in view of the reaction of one-sided body training in limiting the development of proper brain functions. Nevertheless his sensible views, presented in the zenith of his fame and influence, fell still-born before the medical world, contrasting sharply with the favor his theory of internal feeding has received from the same public.

The key to the whole question of one-sidedness of body is the establishment of habit. The nervous system converts the whole body into a unit, knitting together the most distant parts.

The nerves are conductors to and from the brain-pathways of the great currents of life. Habit is defined as the tendency of a given act to repeat itself in the realm of animal life. Habits are, from comparison, called ruts, like the channels which water wears in descending from a height. They become deeper and deeper as the current continues and soon become too deep for the possibility of another channel being formed. Certain nerves to and from a group of muscles control them, at first unequally, but after a while the muscles are compelled to act in unison. At last in the effort of adjusting to harmonious action a muscular movement, at first clumsy and slow, becomes almost automatic; each detail of the movement becomes as it were obliterated. We can not say each nerve conductor does not act separately though we do say the action is instantaneous. However, we recognize with very delicate instruments that the time element does enter. A certain moiety of duration occurs in all rapid conjoined movements, yet we know also they are not strictly automatic, for if one or more of the nerves of a group of muscles be cut between the group and the brain, the action is destroyed as surely as though a wire be cut in a complex system of telegraphy. Beginning with the first action habit becomes more confirmed with each successive act, also easier and more rapid. The effect of habit is especially seen in the successive and simultaneous action of voluntary muscles which are united, as in writing. In these muscular associations if an impulse is started it runs, perhaps, through a long list of words without fresh impulse. The adroitness of handling the pen in continued motion is a matter of education and habit. The musician affords a striking example of the development of the finger movement.

The many paired muscles and nerves of vocalization are so much under the control of the association habit, that were it not for this, no one could ever learn to speak. The power of habit is seen in the association of ideas. We speak of habits of drunkenness, swearing, lying and every modification of speech a thought; habits of industry, order, idleness, vanity, cheerfulness, melancholy; we are called bundles of habits. Habits, also, instead of increasing sensation often lessen it. We habitually come to disregard, after a while, our clothes as well as sounds, though at first conscious of them every instant. Thus habitual motions become changed from volitional to so-called secondary automatic actions as in walking and speaking.

The action of the vocal muscles is preceded by sensation, idea and volition, but after a while it becomes purely sensational or ideagenous—easy and as it were automatic. Habit, first the offspring of volition, seems to become its successor The force of habit thus compares with instinct, and education vies with intuition when habit becomes second nature.

Habits once acquired are not easily discontinued. They are grooves in which the mind is accustomed to move. The great importance of habit is perceived to be economy of time. Through rapidity of muscular action a complete unity of our complex animal organization is effected. To form ruts or habits in the nervous system becomes the potent cause of one-sided action of body and brain. This is seen in the great right and left side deftnesses which become permanent and assume an undue importance in our economy. It is sometimes the left side but nearly always the right. It might as well be both sides.

Besides Dr. Mott, it is said that Dr. Pancoast of Philadelphia, was nearly if not quite an ambidexter; also, Prof. Morse the inventor of the electric telegraph machine.

It is difficult to find in history many examples of ambidexterity. Homer's Iliad describes one of his warriors as throwing a spear with either hand, also some of David's men-at-arms could use both hands. Leonardo da Vinci and Michael Angelo are known to have been perfect ambidexters. Leonardo Da Vinci was not only a distinguished sculptor and painter but a great inventor, machinist, architect and engineer. It is said that after his seventy-sixth year, while working on an order of Francis the First, he was struck with right-sided hemiplegia; he however, continued his work with his left hand and right brain, which was doubtless, from training, equal to the other in functions. Michael Angelo was a man of great intellect and physical energy and lived to great age. It is remarkable that these two eminent men are placed by our Italian statistical and science-gossip Lombroso on account of this feature among his "molloids" or degenerates, who happen to share in the manual dexterity of pickpockets. The latter from neglected training or from obvious professional reasons furnish 1 or 2 per cent. more cases of left-handedness or perhaps partial ambidexterity than are found in the normal population.

We believe the crossed fibers to either brain is a real switching-off apparatus intended as in the case of the eyes for a temporary use. But human custom elects one side to permanent control. The result is then inevitable that nearly all our cerebration is thrown upon one cerebrum, whereby it becomes overtaxed, as it furnishes the nervous energy for both sides of the body through the crossed and direct tracts. It is a reasonable supposition that this leads to brain fatigue and failure, and becomes the most prominent cause of insanity and brain softening. The result of electing the right hand to special action reacts to establish the left brain to control. We find the most important function of speech and language as well as the faculty of discriminating sounds or the power of musical expression located around the left Sylvian fissure, which is clearly indicated by pathologic lesions.

The apparatus of nerve decussation becomes of no importance after the habit of one-sidedness has been established. The brain commissures, even the great corpus callosum, become for the same reason of little or no effect. I find twenty-five cases reported of absence and destruction of this important structure, by disease, with but little disturbance of general brain functions. So decidedly is this true that Dr. Bruce, who has made the largest collection of cases, declares his doubt of the usefulness of the corpus callosum in effecting co-ordination of brain action. The one-sided body-habit clearly makes this large anatomic structure as well as decussation of no effect, defeating thereby the clear purposes of nature as exhibited in all mammals, whereby we should possess two well paired brains perfectly responsive each to each.

The assumption, so generally in vogue, that one-sidedness is natural is only based on the evidence of majorities, leaving out of consideration choice, fashion or custom and the known effect of training, which, in the human race, is absurd. Statistics as respects mankind, for this and other reasons, are eminently misleading.

All arguments based on anatomy as forcing right-sidedness are very weak. The weight of organs on the two sides are not very unequal and the points of support are central from the spinal column. The very slight differences in length, size and direction of the two carotids in front and the vertebrals behind, as affording an unequal supply of blood to the brain, are of no effect. By their many peculiar curvatures while entering the cranium, by their abrupt change of direction to the horizontal at the base of the brain, the opposing currents neutralizing each other, and by the remarkable common reservoir-like circle of Willis the circulation in the two brains is almost, if not perfectly, equalized. There is no difference in the infant in the muscular and body tissues, contrasting sharply with the adult.

THE RELATION OF PHYSIOLOGIC PRINCIPLES TO ARTIFICIAL RESPIRATION.

Presented to the Section on Physiology and Dietetics, at the Forty-eighth Annual Meeting of the American Medical Association, at Philadelphia, Pa., June 1-4, 1897.

BY EDWARD DAVIES McDANIEL, M.D.
CAMDEN, ALA.

As matter is known only by its properties, so life is known only through its functions and other manifestations. Its state or condition is judged from these. It often happens that by concussion and other forms of shock, by submersion in water or other fluid, by smothering and other modes of suffocation and strangulation, by extreme debility and exhaustion, by exposure to cold or heat, by starvation, by the influence of various narcotics and anesthetics, by sudden influence of grief, surprise, fear or other passion, and very notably, by the failure of a prompt occurrence of breathing of the fetus when it comes from the mother, a state of apparent death (call it obscured or depressed life if you choose) is presented. This state has been variously called drowning, asphyxia, syncope, apnea, etc. On proper examination it will be found that the functions of life which are in abeyance in this state of apparent death or depressed life are these: Innervation, respiration, circulation, calorification, sensation, reflex action, phonation, consciousness, voluntary motion, involuntary motion and muscular irritability. It will also be found, after sufficiently numerous and careful observations, that by physiologic law these functions and vital manifestations are so related that whenever any one of them is restored all the others have a tendency to reappear, and whenever any one of them is depressed or impaired all the others show a corresponding depression or impairment. They are so connected that their inception is in a manner simultaneous, their course concurrent, their activity proportionate and their disappearance approximately coeval. This important physiologic law is of great value in the treatment of the depressed states of life. It suggests that the practice of resuscitation should include all known means and expedients which tend to develop all essential functions that may be undeveloped, to restore such as may be suspended and to counteract the bad effects that may result from the want of all those that may be either suspended or undeveloped. As a rule, the function which in any given case first became embarrassed or depressed or suspended and which led to the embarrassment, depression or suspension of the other prominent functions, should be made the prime or main object of remedial treatment. If, for example, by exposure to excessive cold the temperature of a patient has been so reduced as to depress notably or suspend sensibility, motion, etc., the first and most urgent indication is to restore the proper temperature by suitable expedients. If innervation is, from any cause, primarily impaired, the leading measure should be its restoration by electricity or other available appropriate nerve excitant. If the breathing has from any cause been arrested and its arrest has superinduced an embarrassment of the many functions dependent thereon, then artificial respiration is plainly the measure to which we must look as the direct means of restoring the patient.

There is another rule that should not be forgotten in the practice of the art of resuscitation. Though the vital functions are co-ordinate and have an intimate connection they do not all, when disturbed or suspended, involve in equal disturbances or dangers the immediate existence of life. Some are more rapidly influential than others and have therefore a leading importance in practice. The greatest of these, or among the greatest, is respiration. It is the herald of all higher life. It is the harbinger of calorification, of voluntary motion, of digestion, of secretion and of excretion. No human form can give forth any of the higher manifestations of a living soul until there is breathed into its nostrils the breath of life. Hence, among the measures for resuscitation, artificial respiration is entitled to prominence such as natural respiration possesses among the functions which it is the object of resuscitation to restore. Indeed, many of the other measures employed for resuscitation, such as exciting reflex action by spanking the newborn, slapping the pit of the stomach of the adult, squeezing, rolling, twisting, compressing, dilating the sphincter ani with the finger, exciting the rectum with injections or suppositories, using dashes of hot and cold water alternately, immersing in a cold or mustard bath, rubbing with rubefacients, tickling the fauces or nares, using volatile excitants, etc., and the usual preparative of clearing the lungs of gases, mucus, water, blood and other obstructions, though occasionally inaccurately mentioned as modes of artificial respiration, are at the very most merely preliminary and adjuvant thereto. Some of them are

useful, some worthless, and all that are harsh or rough or rapid may be harmful by augmenting an existing condition of collapse.

In addition to the intrinsic merit of artificial respiration there have been other causes of late to urge its importance upon the attention of our profession. In the course of the current half century the great battles, campaigns and wars that have occurred, the augmentation and multiplication of industries and pursuits perilous to life and health, the increase and concentration of population, the allurements, comfort and speed of voyage and travel, have multiplied the cases of accidents and injuries. In response to the demand thus increased, the humane and Christian sentiment of the period aroused itself to great activity in the formation and training of life-saving organizations and in the study and teaching of life-saving methods. During this same progressive half century it came to the knowledge of practical obstetricians (an appalling fact) that thousands upon thousands of speechless human lives were being annually lost at the hour of birth from the lack of a well-devised, prompt and appropriate management. It is not surprising that so great a demand for life-saving methods should tend to produce an over-supply, a result that seems to have happened in the matter of artificial respiration. Previous to 1856, *insufflation* in one way or another was the traditional mode of introducing air into the tubes and vesicles of the lungs of the so-called asphyxiated, especially if these were newborn babes. There are now at least twenty methods, more or less widely known. These differ so greatly and in so many respects that it is not supposable that they can all be equally applicable to all cases, or even to any one case. Some of them are based upon one principle, others on a very different and in some respects conflicting or contrary principle. Some of them may be more appropriate in some cases and less so in others. Some may be admissible in certain cases and inadmissible in others. Some are not safe in any case. Some are claimed to be best suited to the cases of infants, some to those of adults and some to be the best for patients of all ages and sizes. Some of the methods originated in accident, some came prematurely as an urgent need after older methods had been tried and had failed; some after too little observation, experiment and study; a few after profound and prolonged consideration.

There are too many methods. Doubtless the fittest will ultimately survive and the less fit will one by one pass out of use and there will result to the physicians of the world a safe, uniform and effective practice in artificial respiration. But this needed result ought not to be left to the slow work of unaided evolution. A firm reliance may be placed in the sure, safe and necessary guidance of science for the settlement of the facts of science. Wherever there is great variety, diversity or contrarity of method, precept or practice, an appeal to scientific principles, experiments and demonstrations is the direct pathway to truth, harmony and unanimity, and through these to wise methods and successful practice.

For brevity and clearness, it is best to say no more now of the collateral measures and aids in resuscitation and to force into close conspectus:

1. The condition to be remedied by artificial respiration and exactly in what this consists.

2. The lesson to be learned, mainly from physiology, but sanctioned also by anatomy, pathology and clinical medicine, as to the proper mode of accomplishing artificial respiration.

3. The leading methods of artificial respiration now in use and how far they conform or fail to conform to physiologic principles.

The condition to be remedied by artificial respiration is apnea, and artificial respiration consists in mechanically and rhythmically introducing air into the proximity of the blood in the pulmonary capillaries and withdrawing it therefrom. If the temperature of the blood be maintained at about 98.4 degrees F. this mechanical part of respiration virtually insures the chemical and therefore the purpose of artificial respiration is practically accomplished by causing air to pass into the lungs and out of them alternately, regularly and rhythmically. In physiologic or natural respiration the ingress and egress of air and its approximation to the blood, and the reactions between air and blood are the same as in artificial respiration, but the chest movements are due to inward and anatomic influences. In artificial respiration the movements are imparted from without. There are, in all, only two ways in which artificial respiration can be practiced, viz., *a*, the air may be forced into the lungs, the chest walls thus forced outward and the air removed by the weight and resiliency of the chest walls, aided by compression; or, *b*, the chest capacity may be increased and diminished alternately and the air thus mechanically caused to pass in and out successively.

Now, in normal or physiologic respiration *the forcing of air into the lungs plays no part whatever*, but on the other hand *the alternate increase and diminution of the chest capacity by movements of its periphery are the sole agency in bringing air into the lungs and then causing it to go out.*

What relative part the different portions of the periphery of the chest cavity have in varying the capacity of this cavity is plain from their anatomic structure as well as from the facts of physiology. Posteriorly and anteriorly the boundary of the chest cavity is bony and virtually fixed, consisting of the thoracic portion of the spinal column behind and of the sternum before. The lateral boundaries consist of the ribs and intercostal and superimposed structures, have very restricted movements and, therefore, little effect in varying the chest capacity. Thus the posterior, the anterior and the lateral poortions of the chest, so firm and so little movable, proclaim that they are mainly for the support and protection of the parts within. But inferiorly the chest cavity has no fixed limit and varies its capacity easily, greatly and rapidly, by the free movements of the diaphragm through a very wide range. Here, then, in this wonderful muscle is certainly found the leading mechanical instrumentality of respiration. With the exception, perhaps, of the heart alone, it is the most active muscle of the animal body. From infancy to old age, it rests not, slumbers not, sleeps not. If its contractions are less frequent than those of the heart, they are much more prolonged. Its allegiance to the will is less unconditional than is that of the heart. Such is its power that through reflex influence it can call to its aid costal respiration or abdominal respiration as the varying exigencies of disease or condition may require. With matchless mathematic accuracy it is attached to the liver at the one single spot that causes the downward traction of this great gland to augment to the utmost the chest capacity in the upright position and

its upward pressure to diminish that capacity when recumbency is approached. The obvious lesson of physiology, therefore, is clearly this, that the diaphragm being the foremost instrumentality in natural respiration should be employed as the leading agency in artificial respiration. But this invaluable lesson has not been left to rest on even this plain and satisfactory evidence, but has, as if in proclamation of its transcendent importance, received a most rigid demonstration from physiologic mathematics. Soon after the invention of the spirometer by Hutchinson, it was proved by actual measurement that the capacity of the chest is greater in the erect than in any reclined or in the recumbent position. Thus was demonstrated in stubborn figures a great fact for physiology, for pathology and for therapeutics. The chest is a cylinder and the diaphragm is a piston whose to-and-fro motion varies the chest capacity and causes an ingress and egress of air. In the recumbent position the liver and other contents of the abdomen press upon the diaphragm and diminish the chest capacity.

In changing from the recumbent to the erect position the pressure is gradually removed and the chest capacity increased. It is obvious that all that is necessary for the air to enter the lungs is to change the patient from a recumbent or any inclined position to the erect one, and all that is necessary to cause air to pass out of the lungs is to move the patient back from the erect to any inclined or to the recumbent position. But I have ascertained that the increase of capacity of the chest is slow and small in moving from the recumbent position to an elevation of forty-five degrees, and rapid in ascending from forty-five degrees to the erect position. It is not, therefore, essential in practicing artificial respiration to move the patient through the whole range from recumbency to erectness, but is sufficient to use only the upper half of this range, merely moving the patient from a forward inclination of forty-five degrees to the erect position and back again. Every upward and backward movement produces an inspiration, and every forward and downward movement an expiration, and the two together a complete respiratory act. By regularly repeating these acts artificial respiration is rhythmically performed and can be prolonged at will. Any one, by experimenting on himself, will find that if he leans forward from a perpendicular to an inclination of about forty-five degrees, he will mechanically and involuntarily make an expiration, and if he then straightens back to the erect line, he will mechanically and involuntarily make an inspiration. *He can not by any effort of volition prevent the result or reverse it.*

The fact of the increased capacity of the chest in the upright position, gives a solution of certain striking clinical facts. It furnishes the rationale of orthopnea and makes clear the reason why the smothering asthmatic instinctively and hurriedly leaves his horizontal posture, assumes a sitting position and, supporting his elbows on his knees, or on a table, breathes by performing in miniature the very movements above described. *He can not breathe without performing the movements, and he can not perform the movements without breathing.*

Many of those who have introduced, or have written upon methods of artificial respiration, have maintained, or at least have admitted, that in any case of collapse, the relaxed tongue and epiglottis have a tendency to fall back, close the glottis and thus prevent the access of air to the lungs. Dr. Fothergill is said to have published an opinion of this kind in 1794. Marshall Hall, Mr. Bowles and Mr. Fox made some experiments, published in the London *Lancet* in 1856, which they thought proved that in the supine position the relaxed tongue must necessarily fall back and exclude the air from the trachea. But the Royal Humane Society and many of the leading medical men of Great Britain, after thorough investigation and careful experimentation, rejected the opinion of Fothergill and Marshall Hall concerning this alleged obstruction of the glottis, and laid aside the use of Hall's "Ready Method," the main merit claimed for which was the avoidance of this supposed obstruction. The whole discussion originated in a great mistake of these great men. The physiology of the closure of the glottis was misunderstood by them, though it had been clearly made out under numerous observations and experiments by Magendie and published by him in his great work on physiology, in the early part of this century. This closure is effected not by the descent of the epiglottis, but by the ascent of the glottis. Any one can satisfy himself of this by placing his finger on the upper margin of the pomum Adami and performing the act or deglutition. He will find that the glottis during the act rises at least an inch in the average person and hides itself beneath the epiglottis, effecting the closure in this way. If there is any danger therefore of this alleged obstruction of the glottis, it is least in the erect position, in which the weight of the lungs and trachea tend to keep the glottis pulled open, and greatest in the recumbent position adopted in Hall's "Ready Method" and Sylvester's method, and in all the inverted or head-down positions in which the lungs and trachea gravitate more or less toward the epiglottis.

It now only remains to note cursorily the leading methods of artificial respiration now in use, and to remark wherein each may be found in accord or not in accord with the physiologic principles presented above.

Insufflation (traditional) is perfomed by placing the patient in the recumbent, supine position, grasping with one hand the nose and with the other compressing the esophagus, applying mouth to mouth and inflating the lungs of the patient with the expired air of the operator, then allowing and aiding the escape of this air by opening the patient's mouth and pressing his chest, and repeating this procedure about fifteen times per minute. Objections: The recumbent position is one of small chest capacity; the air used is vitiated and non-vitalizing; the manipulations complicated, difficult and oppressive to the patient; the stomach is liable to be inflated, the air cells are liable to be damaged by stretching and even fatally ruptured, and uses of air to dilate chest contrary to nature.

LeRoy's method consists in applying a many tailed bandage around the chest of the patient in the recumbent supine position and producing chest movements by alternately tightening and slackening of the bandage. Objections: The recumbent position; the two operators required; the delay and trouble in getting bandage.

Marshall Hall's ready method (1856).—Place the patient in the recumbent position and prone. Turn the body gently but completely on the side and a little beyond and then back on the face alternately, repeat-

ing these movements deliberately, efficiently and perseveringly, fifteen times per minute. When the prone position is restored make equable but efficient pressure along the spine removing this pressure immediately before rotating back on the side. Objections: Recumbent position; small difference of chest capacity commanded by the movements, the harm that may be caused by the pressure.

Sylvester's method (1858).—Place the patient on his back with his shoulder's raised and supported on an article of dress, folded. Raise his arms upward by the sides of his head and then extend them gently and steadily upward and forward for a few moments. Next turn the patient's arms downward and press them gently and firmly against his sides for a few moments. Repeat these movements alternately, deliberately and perseveringly fifteen times a minute. Objections: The small chest capacity of the virtually recumbent position and the small variation of chest capacity produced by the movements.

H. F. Campbell's method.—Place the patient in the erect sitting position with his arms by his sides and his head erect. Raise his arms up by his head to a parallel position and exert upward traction on them. Replace the arms to their first position by the sides and press them against the chest. Repeat these movements *ad libitum.* Objections: The relatively small variation of chest capacity attainable even in the erect position steadily maintained.

Pacini's method.—Place the patient supine with shoulders and head slightly raised. With the thumbs well back on the scapular region and the fingers under the outer end of the clavicle and in the axilla, draw the clavicle and shoulder upward and backward, thus causing the pectoral muscles to elevate the chest walls. Then turn loose and let the chest walls descend, aiding by gentle compression. Repeat regularly as desired or required. Objections: The small chest capacity of the virtually recumbent position and the small variation secured by the movements.

The Michigan method.—Place the patient flat on face and stand astride of him with your face toward his head. Seize his shoulders and elevate his chest while you count slowly "one, two, three;" then allow the chest to return to its first position and press gently but firmly while you count "one, two." Repeat these movements fifteen times per minute. Objections: The horizontal position with its small chest capacity; the small increase obtainable by any elevation of less than 45 degrees, and the interference with ingress of air due to flexure forward of neck and trachea.

Shepard's method.—Place the patient on a plank or door shutter, and place the shutter or plank crosswise at its middle on a log or similar report. Then give to the patient's head and feet an alternate up-and-down movement by a like movement of the plank or shutter. This alternately increases and decreases the chest capacity, thereby promoting ingress and egress of air. Objections: Not available for infants; inconvenient and often impracticable; movements can not be carried to above 45 degrees and, therefore, can not reach the higher measures of chest capacity.

Nélaton's method (so-called).—This is a misnomer, not a method of artificial respiration, but of drainage of narcotic, anesthetic or other heavy vapors or poisonous gases from the air passages. It consists in holding up the lower parts of the body and causing the head to hang down.

Laborde's method consists in seizing the tongue by the tip, drawing it out and allowing it to recede rhythmically. This rhythmic action, by a physiologic law, tends to arouse other rhythmic movements, including the respiratory. It is not properly respiratory, but merely excito-respiratory.

The Alabama method (1860).—Place the patient in sitting position inclined forward about 45 degrees. Move the head and shoulders upward and backward to the perpendicular position or a little beyond, taking care that the trunk is drawn up to perfect straightness and the head, neck and shoulders well up. Lean the patient forward and downward to an inclination of about 45 degrees, making cautious and reasonable compression of the chest. Repeat these movements deliberately, perseveringly and with reasonable frequency until no longer needed, or until all hope of success is lost.

Howard's method (1871).—Place the patient on his back with a roll of clothing under it, so as to raise the pit of his stomach above the level of any other part of his body. Kneel by the side of or astride the patient's hips and, with the balls of the thumbs resting on either side of the pit of the stomach, let the fingers fall into the grooves between the short ribs so as to grasp the waist. Now, using the knees as a pivot, let the operator throw all his weight forward upon his hands and squeeze the waist between them as if he wished to force everything in the chest upward out of the mouth, and deepen the pressure while he counts slowly, "one, two, three;" then suddenly let go with a final push which springs him back to his position on his knees, where he remains so long as to count "one, two." These movements are to be repeated and gradually increased in frequency from four to fifteen times per minute and continued from one to two hours, or until the patient breathes. Objections: The disadvantage of the horizontal position is present and is made worse by the sharp flexure at the waist; the great pressure at the pit of the stomach approaches in effect punches or blows on that most sensitive part, and through the injured function of the solar plexus, greatly depresses and endangers the patient.

Schultze's method. — Stand up, grasp the baby around the shoulders with your fingers posterior and thumbs anterior, meeting in the axilla, thus suspending the baby, feet downward and head upward, in front of you with its face from you, swing it rapidly through a semicircle in front of you, bringing it to rest with its buttock near your face, and after a slight pause reversing the movement. Repeat these movements as required. Objections: Requires great care and gentleness and exposes to rapid reduction of temperature.

Fell's method consists in forcing air into the lungs through the incision in laryngotomy or tracheotomy. For this purpose a bellows with tube is employed. This is designed mainly if not exclusively for surgical cases. Objections: Like insufflation it forces instead of attracting air into the lungs; increases the danger of overstrain and rupture of the air vesicles.

Reynolds' method consists in grasping the babe, with the hands just above the pelvis, the thumb being on one side, the fingers on the other and the palm applied to the sacrum and adjoining part of the spine, and thus causing the babe to hang head downward. The other hand of the operator is then glided along the babe's abdominal surface and used to apply gentle

pressure while anterior flexion is imparted to the trunk of the patient. Objections: Looks to drainage rather than to aeration and chest expansion.

Other methods are: Dyer's method; Dew's method; Forest's method.

These methods consist in varying the chest capacity and the in and out movements of the air, by manipulations and varying positions of the babe. Objections: Do not sufficiently recognize the importance of the upright position and of the agency of the diaphragm.

THE RELATION OF FOOD, AIR AND EXERCISE TO HEALTHY GROWTH AND DEVELOPMENT.

Presented to the Section on Physiology and Dietetics, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

BY E. STUVER, M.Sc., M.D., PH.D.

Member Colorado State Medical Society (Vice President 1894); Member American Medical Association; Member International Medical Congress (Berlin); Active Member National Educational Association, etc.

RAWLINS, WYO.

"Man is what he eats," is a truism quite widely appreciated theoretically, but sadly disregarded when put into everyday practical use. Nor is this true only of the unprofessional multitude but applies with almost equal force to the great army of physicians who by their habits say in the most forcible manner, "Do not eat as I eat but eat as I tell you."

This being the case, and as an ounce of good example is worth pounds of precept, unless put into practice, let us see what influence a rational system of dietetics, pure air and plenty of exercise would have on the growth and development of the rising generation. I say rising generation because the time spent in trying to reform confirmed transgressors whose habits have become fixed by years of indulgence, is largely lost and can be spent to much better advantage in preventing the formation of bad habits by the young and helping them to overcome those which have been formed.

I shall use the term food in its comprehensive sense, including beverages of all kinds. The period of growth and development is characterized by rapid metabolism; old tissues are broken down and new ones formed more rapidly than in the mature body. These rapid changes necessitate a larger proportionate quantity of food and require that the digestive and assimilative organs be in a healthy condition so that sufficient pabulum may be furnished to supply the needs of the rapidly growing organism.

A healthy condition of the digestive and assimilative organs being one of the prime requisites to insure proper growth and development, the question naturally arises, How can such a condition be attained? Every child has the right to inherit a sound physical organization, and it should have a mother capable of furnishing it with an abundant supply of nature's true nutrient material which, if normal, far outranks all other foods for the infant, the patent baby-food manufacturers to the contrary notwithstanding. During the early years of childhood the food should consist largely of milk, be plain, nutritious and unstimulating and regular habits of eating should be established. Young children frequently suffer from thirst and should be given cold water regularly. This will often afford relief when soothing syrups fail. In this connection I insist on the importance of protecting the child against stimulants and narcotic poisons of all kinds. To accomplish this the physician must throw sentiment aside and give the officious grandmothers, neighbors, *et id omne genus*, distinctly to understand that the child has some rights which should be respected and that one of these is that it should be allowed to form its own drug and poison habits. If this is not done the infant will scarcely be born before some one will suggest that an abominable decoction of herbs or a fiery dose of liquid poison in the shape of brandy and water be poured down its defenseless throat in order to keep it quiet. The natural protective instincts rebel against all stimulants and narcotic poisons.[1] To the infant or young child the first dose of an alcoholic stimulant is exceedingly distasteful, and it is only after a number of trials have been made and the natural protective instincts have become obtunded that it begins to be at all relished. The system at first surprised and insulted makes a vigorous effort to throw off the poison, but at each repetition the resistance becomes less until it finally adapts itself to the abnormal stimulation and the stimulant becomes an imperatively demanded want.

In this way an abnormal condition of the system with a craving for pungent, highly spiced foods, alcoholic stimulants and narcotics is established. This not only causes a distaste for plain and nutritious foods which are absolutely necessary to the most complete growth and development, but naturally leads to the use of tobacco in its various forms and may eventuate in the use of alcoholic stimulants and other narcotic poisons, and finally we may have before us one of those saddest of all spectacles—a grand physical organization shattered and wrecked, a brilliant mind weakened and dethroned and a moral nature which, under other conditions, might have strengthened and elevated mankind, reduced to the lowest depths of degradation—in short an alcohol maniac, a morphin or cocain fiend or a combination of all in one

If every physician could have these sad tragedies burned into his very soul and would then rise to the true stature of his noble calling and impress upon his friends, his patients and the world, the causes of these terrible examples which are continually falling under his observation and the means by which many of them could have been averted, we would soon see a decided improvement in the habits and health of the young.

While proper food and correct dietetic habits are of the greatest importance to the welfare and happiness of mankind, the quality of the air or gaseous food, of which we take into our lungs about one pint at each inspiration is, if possible, of still greater importance. Man can live on one meal a day and enjoy good, nay, even robust health, he can limit himself to the simplest and plainest kind of a dietary and attain a ripe old age; but let the supply of oxygen be cut off and he succumbs to carbonic acid poisoning in a very short time.

Plenty of pure air and properly regulated outdoor exercise are necessary to give nerve force; to stimulate the respiration and circulation of the blood; to develop the muscular system; to throw off or destroy the poisons constantly accumulating in the body; to strengthen and calm the mind and to produce the best moral development in persons at any age.

During the period of childhood and youth, however, when the metabolic changes are much more active;

[1] Vide Oswald's Physical Education.

when the poisons from the breaking down cells accumulate much more rapidly; when the muscular system is in an undeveloped condition and needs almost constant exercise for its proper growth; when the brain is more unstable, more easily irritated and more susceptible of being permanently injured, their importance is still much greater, and should be much more fully appreciated, than they are by the majority of people. Living and sleeping rooms should be large, well lighted and thoroughly ventilated. The covers should be thrown back from the beds, the blinds and windows opened and the pure, life-giving air and sunshine allowed to bathe the living and sleeping rooms. This may tone down the colors of beautiful carpets, but it will at the same time destroy foul exhalations and disease germs and put roses of health in the pallid cheeks of delicate children, and give a buoyancy and zest to life which can never be experienced while living in a foul atmosphere. Then, too, the school rooms in which children spend a large part of the time during the most critical years of their lives should conform to the most approved sanitary knowledge of the age. Ample provision should be made for complete drainage, the best methods of heating and lighting and for thorough ventilation should be employed. To insure a sufficient amount of oxygen all school rooms should be aired both morning and evening and at intervals during the daily sessions. This can be best accomplished by having frequent recesses during which the doors and windows are thrown open and the rooms thoroughly ventilated. President Eliot of Harvard University, President Holbrook of Lebanon, Ohio, President George L. Osborne of Warrensburg, Mo., Prof. Joseph Baldwin of Austin, Texas, and many other eminent educators advocate an open air recess at the end of each hour. Their contention is certainly based on sound physiologic and hygienic principles, and if their suggestions were carried into effect generally, there would be an immense improvement in the health, mental attainments and moral character of children all over the land.

I do not believe any one will question the fact that frequent outdoor recesses would have a most beneficent effect on the health of the pupils. Nor do I think, when the matter is carefully considered, that the conclusion will be different as to their influence on mental and moral development It is well known that in order to insure proper development of the muscular system, the motor centers are developed early and hold a commanding position. In these centers nerve force accumulates and is stored until discharged in muscular movements, and if the attempt be made to restrain these movements beyond a certain limited time by means of the will, much nerve force which should have been used in quiet thought and study will be wasted and at the same time the physical organism will be hindered in its development. Then, too, the toxins which have been accumulating in the blood poison, weaken and tire the brain, and as a consequence mental results are unsatisfactory, because impressions made on a tired brain do not last, and the moral nature is depraved because pure and generous thoughts can not long exist in a foul body.

The Venom of Serpents.—The well known fact that the venom can be sucked out of a wound without inconvenience, is attributed by Fraser to the bile in the alimentary canal. He has demonstrated that even very small quantities of bile will render snake venom harmless.—*Nouv. Remèdes*, January 8.

THE HAIR-CELLS OF THE ACOUSTIC AND AMPULLAR AREAS OF THE EAR.

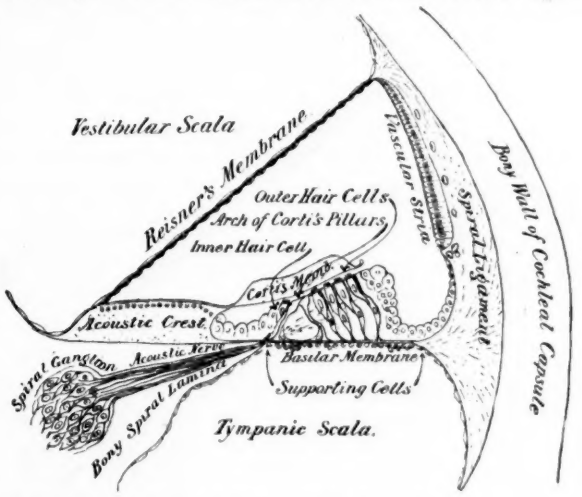
Presented to the Section on Physiology and Dietetics, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

BY B. ALEX. RANDALL, M.A., M.D.

PROFESSOR OF OTOLOGY, UNIVERSITY OF PENNSYLVANIA AND PHILADELPHIA POLYCLINIC.

There ought to be small difficulty in demonstrating these structures to the satisfaction of the trained microscopist, who is accustomed to piece together fragmentary structures in full realization of the infrequency of ideally complete preparations; but those more engrossed in clinical medicine are less apt to obtain from our usually imperfect specimens a clear and coherent picture. The less direct method, therefore, of tracing the development of these specialized cells and their auxiliary apparatus from the primordial blastoderm, has the advantage of showing with greater ease and certainty the differentiation of these and adjacent cells of like origin; the building up of the complex structures of which they form a part and by a series of demonstrations, confessedly imperfect individually, it forms a sort of composite picture little short of the ideally complete.

Shortly after the formation of the cerebro-spinal

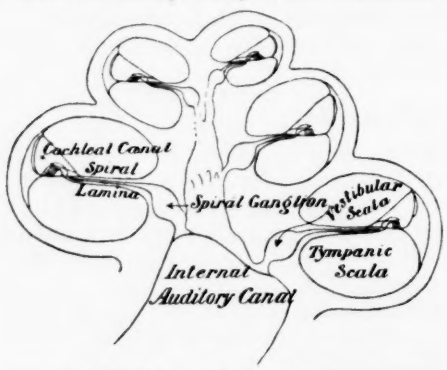


axis by involution of the epiblast, a similar process at each side of the head of the embryo invaginates a new bit of epiblast and forms a closed and independent sac, the otic vesicle. This elongates and throws out hollow buds, forward to form the spirally coiling cochleal tube, inward to constitute the endolymphatic duct and sac, while others starting up, back, out and down, curve to meet and coallesce into three semi-circular canals, each occupying a plane at right angles to that of each of the others. Meanwhile the central sac divides into an anterior saccule and posterior utricle, united only by the forked endolymphatic duct, and the full-formed mammalian labyrinth is complete. Every part of its wall is made up of one or more layers of the cells which have been invaginated from the epiblast; but while it has been developing and the surrounding mesoblastic tissues have been building an elaborate set of supporting structures, the advent of nerve-fibers from the brain has enabled certain of its parts to undergo special differentiation. Such nerve-stimulus is applied to no part of the semicircular canals except the concavity of the flask-shaped ampulla which connects one end of each to the utricle. Here a crest forms upon which the cells become elon-

gated cylinders surmounted by stiff hairs, above which floats a gelatinous film, apparently an early product of their activity. These cells are demonstrably the end-organs of the nerves here distributed, which as ultimate fibrils have been traced to or into the hair-cells. Each has a thick free end, above which extend the hairs, generally agglutinated into one or more marked projections which extends well out into the lumen of the ampulla.

In the vestibular sacs, a like area is marked off, larger, flatter and less pronounced. That of the utricle is on the side nearest to the oval window, and is almost continuous with the crest of the horizontal external semicircular canal, the bases and not the hair-crowned tips of its hair-cells are turned, therefore, toward the entering waves of sound. The "macula" of the saccula, on the contrary, is on the farther mesial wall, with the hairs of its cells directed toward the foot-plate of the stapes. Each of these areas presents cylindrical hair-cells with supporting layers beneath, probably of reserve cells to replace those which become effete. The hairs are short and separate and the gelatinous blanket which floats above these as well as all the others, is loaded with crystals of carbonate of lime, the otoliths. Here too, the nerve connections have been satisfactorily demonstrated.

This much is fairly simple, for sections can put



these parts with little confusion before you. But in the cochlea the complexity of structure and relation is far greater. Here the cylindrical tube which we have seen coiling forward, has become narrowed off from the saccule with only the tiny "canalis reuniens" to unite them. It has become compressed into a form triangular in section, one wall forming the convexity of its turns and being in close relation always to the ensheathing mesoblastic tissues which are building the future bony "snail-shell." Within the coil a conical axis of cartilage, early ossifying, pushes forward with the fibers of the cochlear nerve and throws out about its branches a hollow shelf with spiral winding to meet the inner edge of the triangular cochlear tube. A fibrous extension of this, out beneath the under (lower-mesial) surface, forms the important membrana basilaris, the stiff radiating fibers of which probably act as the strings of a musical instrument to receive and vibrate to tones of various pitch.

Blood-supply and probably trophic nerve-fibers cause the cells of the outer wall to develop into a gland area of cylindrical cells, the stria vascularis, doubtless secreting the endolymph. The cells of the upper wall flatten into a delicate pavement upon Reissner's membrane, inconspicuous and probably functionless. It is upon the basilar membrane, however, that the really important differentiation of the neural cells takes place, for it is here that the cochlear nerve-fibers are distributed. An elaborate supporting structure of arching Corti's pillars forms a tunnel against which lean the hair-cells, in single row to the inner, in three to five rows outward. Beyond them in each direction cylindrical and spherical cells pile up, perhaps in mere support, more probably in reserve; and above them a reticular membrane steadies them while presenting meshes for the protrusion of their ciliated ends. Over all hangs the usual gelatinous blanket, Corti's membrane, here attached at its inner margin to a toothed crest of the periosteum of the spiral lamina. Its function here as elsewhere is somewhat doubtful. It may serve to dampen the vibrations of the underlying structures as soon as cessation of the exciting sound-waves robs them of energy enough to throw it clear of such interference, or it may better be compared to the hammer which strikes upon the hairs to stimulate the nerve-endings in them. As in the pianoforte, it may subserve both purposes.

The hair cells themselves are noteworthy as being twin-structures, consisting of a fusiform Deiter's cell, below having a delicate foot emplanted upon the basilar membrane in strict alignement with its fellows of the same row, and its upper process attached to the reticular membrane above and adherent to the peg-shaped hair-cell which it holds aloft. The hairs are short and stiff, set in crescentic order across the summit of each hearing-cell and protruding through the meshwork which encloses them. The fibers of the cochlear nerve enter the modiolus through a series of minute openings and to pass out between the plates constituting the bony spiral lamina. A spiral canal which they intersect in their entrance to the lamina contains a ganglionic mass with which they are in intimate relation. At the margin of the lamina they pass upward through a regular row of minute foramina, losing their sheaths as do those of the optic nerve at the lamina cribrosa; and breaking up into ultimate fibrils, they can be traced, some to the inner hair-cells, others across the tunnel of Corti's pillars to the outer hair-cells and some along the tunnel to undetected termination. It is a mooted point whether they penetrate the hair cells or only reach their exterior; but it seems relatively unimportant to trace the precise manner of their connection, so long as there is no doubt of the main fact of their direct distribution to these hearing-cells.

In spite of all attacks upon it, the theory of Helmholtz, as to the function of the cochlea in the perception of musical tones stands without reasonable alternative. The stiff radiate fibers of the basilar membrane, increasing manifold in length and tenuity from the basal to the apical turns, are like so many harp-strings (24,000, by some estimates) attuned to vibrate to sounds of every pitch audible to man. Upon them rest the hair-cells, fitted to convey to the sensorium all recognizable variations of pitch; and pathologic research enables us to predict cochlear lesions which are found in the lower or upper parts of the cochlear turns according as there was loss of perception for high or low tones. Noises of mixed or unmusical character are probably perceived in the differentiated portions of the vestibular saccule and utricle.

As to the semicircular canals, most authorities concur in regarding their function as pertaining to equilibrium and not to audition. Clinical and experimental pathology unite to show that severe vertigo is usually the result of irritative lesions here; but that this is relieved by the advance of the condition to the destruc-

tive phase. This is the basis of Charcot's use of heroic doses of quinin for labyrinthine vertigo. As to the physiology of these canals as constituting a space organ, this has an easy explanation and demonstration, usually overlooked. Just as the water in a glass remains nearly unmoved while the glass is rotated rapidly around it, so the movements of the head rotate the semicircular canals upon their contained columns of fluid, making in one or more of the canals virtual currents in reverse of every motion. The hairs of the ampullar hair-cells instantly yield to and record these currents, their strength, direction and duration, and thus convey to the sensorium a report of every such alteration of position. The muscle-sense and the palpable recognition through the skin of the direction of gravitation aid the eyes in furnishing corroborative or corrective data, means which may at need replace the lost space-organ of the aural labyrinth in informing us of our relation to our surroundings; but so long as it is present and unimpaired, it is probably the foremost source of such information.

AIR IS FOOD; NITROGEN.

Presented in the Section on Physiology and Dietetics, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1–4, 1897.

BY EPHRAIM CUTTER, M.D., LL.D.

NEW YORK, N. Y.

Even if unproved nitrogen is in too large proportion in the air to be inactive. When a student I heard Profs. B. Silliman Sr., Josiah P. Cooke and R. E. Rogers teach that nitrogen was negative and useless, a diluent, and that all biologic researchers maintained this position.

I could not, while respecting the dictum of these eminent men, assent to this, because nitrogen was four-fifths the bulk of air. It seemed to me that the chemists were like physicians who could not tell what was the matter, when it was patent to all that there was something wrong, and who must confess their inability in diagnosis.

Since my pupilage I have eagerly watched for evidence to support my position, and have found some that I present hereunder.

AIR IS FOOD.

This idea is over 3,000 years old. Air is indispensable to life. Eaten twenty times a minute during life. If oxygen combines with the tissues, blood for example, it becomes a normal part of the body. But oxygen is only one-fifth of the air. Nitrogen is four-fifths, and yet has nothing to do as food. This is contrary to common sense. What other food is there where only one-fifth is utilized?

Water is food. None deny that hydrogen is not food. To be sure there is more or less waste of food; but four-fifths, can this be? Are 80 per cent. of clothing, tissue, apples, beef, potatoes useless?

Again nitrogen is found in the body in large quantities. Take the proteids, C, H, O, N, S, which are the most important animal and vegetable compounds, and no phenomena of life occurs without their presence.

Subdivided.—1, albumins; 2, globulin; 3, albuminates or derived albumin; 4, proteoses (found in digestion, and in time passing into peptones); 5, soluble proteids formed by digestion by pepsin or trypsin; 6, coagulated proteids. Nitrogen is not useless and negative here certainly.

As ammonia nitrogen is found in the blood, feces, urine, sputum, horny tissue, etc. Indeed in proteids we have nitrogenous foods in abundance.

Nitrogen is active enough in the following substances: *a*, common gunpowder which is made with saltpeter, KO, NO_5; *b*, gun cotton made of cotton and NO_5; *c*, nitro-glycerin; *d*, dynamite. In these substances nitrogen is active enough to satisfy the most exacting critic.

Explosives are positive substances, acting with terrific force and violence. They are the least negative and useless substances. Let us quote from the most admirable "Standard" dictionary the list of explosives containing nitrogen; 1, gunpowder family, 25 varieties; 2, nitrate mixtures with the gunpowder, Na, Ba, NH_4, O, 66 varieties; 3, nitro-glycerin family, 121 varieties; 4, gun cotton and nitro substitution compounds made by substituting NO_5 for H, 89 varieties; 5, picric acid, $C_6H_3N_3O_7$ family, 20 varieties; 6, fulminic acid group = $H_2C_2N_2O_2$, 52 families; 7, Sprengel explosive family, 7 varieties; must have nitrogen, non-nitrogen explosives; KO,ClO_5 family, 78 varieties. Out of 456 explosives 378 are compounds of nitrogen, or about 83 per cent. But when it is considered that the chlorate of potassium group after explosion furnish compounds of nitrogen from the air, it may be asserted that all explosives depend on nitrogen. This is a strong showing. Explosive nitrogen in these compounds is in smaller proportions than in the air we breathe, and yet it is deemed inert in us.

BACTERIAL NITROGEN.

It has been proved that bacteria living on the roots of plants do enable the plants to assimilate nitrogen. To show that the chemists are veering to the writer's position I quote the following paragraphs from W. B. McVey, professor of chemistry, College Physicians and Surgeons, Boston.

IMPORTANT FUNCTIONS OF NITROGEN.

The great strides that have been made in the advancement of physiologic chemistry, have to my mind called for a more thorough study of the so-called indolent element, namely, nitrogen, which is usually regarded as having no particular function except to act as a dilutant or a check, so to speak, on the activity of oxygen.

Let us for a moment consider the growth and development of cell life, its causes and effects. It is a well known fact that a complex form of matter was necessary before life could appear and before the physical agencies of nature could elaborate the substance in the form of what we call protoplasm, which is the same in all animal bodies, to-wit, a viscous jelly-like matter possessing motion, secretion, digestion, excretion and reproduction.

As we ascend from the first cell of protoplasm in the scale of vitality, we reach that degree where the crystallizable matter of the higher species is required, so we find intimately combined in the albuminoid principles, the colloid (gluey) and crystalloid (crystal forming). The colloids of protoplasm are proteids and permeate the crystalline part of the animal body, and in presence of the mineral matter therein continues the chemical change going on.

The crystalloids go to build up the fiber of the body. The colloid institute and continue the power of its reproduction, and carbon and phosphorus being present in the former, life depends upon a certain chemical nucleus in order to associate itself with matter. Every living thing requires this nucleus.

Heat, light, electric and mechanical power and magnetism are the agencies acting upon this nucleus through the agency of nitrogen, causing and bringing by colonization the many kinds of animal bodies into existence.

The spectroscope shows that sulphur and phosphorus are compounds and not elements; and that phosphorus is produced from a differentiation of sulphur by the action of chlorin and hydrogen. It is the potential action of nitrogen upon this that causes the chemical and physical changes, and starts the process of ultimate production of protoplasm and afterward animation. It is brought about by action of sunlight upon the phosphorus contained in the nucleus, attracting the electric energy that is pent up in the so-called useless nitrogen. Then by the aid of magnetic iron, carbon and amorphous matter draws forth the electric energy from the earth through phosphorus as a nucleus, which starts the oxygenating process.

Nature requires motion in animal bodies before locomotion can take place, the force and power of such motion being supplied from the food and air.

If it were not for nitrogen locomotion could not take place. Pent up it is more electric potentiality than any other element in nature. This potentiality institutes the power of locomotion in all animals either by direct or indirect transmission and modification.

It is not the vivifying power of oxygen but the explosive power of nitrogen that originates locomotion, and by its rhythmic explosion the respiratory process originates and continues, which is the cause of that motion in nutrition.

Nitrogen, which is supposed to be the most indolent thing in nature, is indeed the most powerful and essential to the movement of all bodies, since explosion depends upon the constant instantaneous liberation of nitrogen, it also acts as a controlling agent to prevent the too rapid reduction of the tissues. It controls the chemical action of respiration.

Nitrogen enables the body to perform its functions to the end of the organizing process, which culminates in the separation of the vital from the chemical.

Conclusion.—If life is made up of motions and emotions, and if nitrogen is such a kinetic agent actual and potential as has been pointed out, then it appears reasonable that it is not a mere diluent and negative in human food.

THE ACTION OF ODORS, PLEASANT AND UNPLEASANT, UPON BLOOD FLOW.

Presented to the Section on Physiology and Dietetics at the Forty-eighth Annual Meeting of the American Medical Association, at Philadelphia, Pa., June, 1-4, 1897.

BY EPHRAIM CUTTER, M.D., LL.D.

NEW YORK, N. Y.

In 1859, Alvan Clarke made me a laryngoscope. After 1862 I studied auto-laryngoscopy and auto-rhinoscopy. I took the first photographs in this continent of the living larynx in 1866; copies of these are deposited in the United States Army Medical Museum, Washington.

I was and am able to demonstrate to myself, my posterior nares, either Eustachian orifice, turbinated bones, dome of pharynx, vomer, etc.

Among the physiologic studies made in 1866 was the action of cologne, roses, camphor, ammonia, sulphur fumes, etc., upon the erectile tissues of the turbinated bones. They were of a pale ashy white color ordinarily. A few whiffs through the nose of any of these odors increased the blood flow and produced immediately a livid injection and turgescence of the erectile tissues on the turbinated bones, that stood out as clearly and positively as the erection and turgescence of the livid wattles of an excited turkey cock. It was a surprise to find that these pleasant and unpleasant odors acted alike. I found in the case of sulphur fumes, that when I could not inhale them from a match ignited before my face, with open mouth, I could breathe readily through my nose. This proved that the erectile turgescence availed to remove the sulphurous oxid so as to have respirable air and protect the inhaler.

The morphology of nasal excretions excited by the morphologic elements found in the impure air, also proved the value of the irritated turgescent mucous membrane of the nares in arresting foreign bodies borne in on the atmosphere.

ARROW-ROOT, CASSAVA AND KOONTI.

Presented to the Section on Physiology and Dietetics, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

BY A. T. CUZNER, M.D.

GILMORE, FLA.

ARROW-ROOT.

Arrow-root (*Maranta Arundinacea*) is the name the Indians of America gave this plant. In German arrow-root is called *pfeilwurz*, *pfeil* meaning arrow, and *wurz* meaning root. It is the English name of the botanical genus *maranta*, the type of the endogenous order *Marantacea*, called by Lindley in his "Natural System of Botany" the arrow-root tribe, but altered in his "Vegetable Kingdom" to maranta.

The flowers of this plant are in long, close spike-like panicles with irregular corollas, each having a single perfect stamen with half another. The veins of the leaves run out obliquely from the midrib to the margin. The root is a fleshy corm which when washed, grated and strained, and again repeatedly washed, furnishes the substance so much prized as food for invalids.

The starch extracted from the rhizomes of different *maranta*, and imported into the United States and England, takes the name of the place from which it comes. Thus we have Bermuda arrow-root, East Indian, St. Vincent, Natal, etc., True arrow-root is without doubt the best of all the starch foods to be obtained in the market; hence it is largely adulterated with other and inferior starches, which adulteration is readily detected under the microscope. In England attempts have been made to call every prepared starch arrow-root bearing the slightest resemblance to the true *maranta*. This has failed there owing to the passage of the "Adulteration Act."

It is now understood by public analysts, magistrates, etc., that arrow-root must consist entirely of the starch extracted from the rhizomes of a *maranta*, and any admixture of potato or other starch is regarded as an adulteration. Arrow-root is much more used in England than in the United States, both as ordinary food and as a preparation for the use of invalids and infants. In the former country they prepare what is called white soup by the addition of arrow-root.

The price of arrow-root in England ranges from 13

to 50 cents per pound. It is not much used in the United States. This may be owing to the difficulty of obtaining a pure article, and therefore the true value of arrow-root is not properly appreciated.

It is an excellent material to mix with cow's milk in order to cut up and dilute the excessive proportion of casein. Human milk contains but 1 per cent. of casein, while that of cow's contains 4 per cent.

As a food for young children (and even infants) I prefer arrow-root to barley. Arrow-root should be more largely used in inflammatory diseases of the alimentary canal. It is by far the most palatable of all the different starch preparations.

Figure 1 represents an arrow-root plant, with A, an enlarged drawing of a rhizome. These drawings were made by the writer from a specimen plant of Bermuda arrow-root grown on his own place in Florida.

The drawing of starch cells (Fig. 2), was made from sample of starch obtained from the roots and viewed under the microscope.

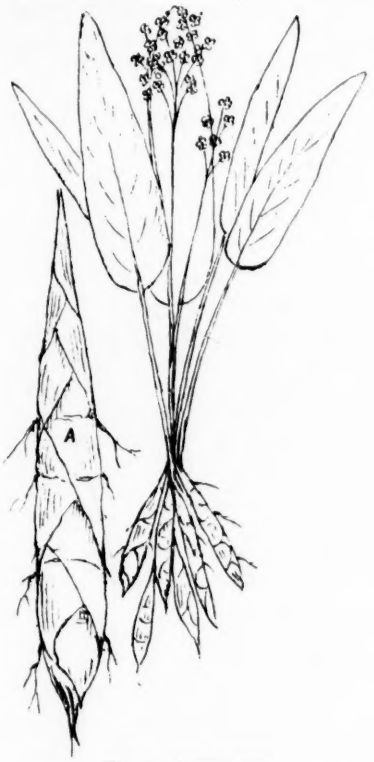


Fig. 1.—Arrow-root.

The plant is easy to cultivate. In fact once planted it is very hard to get rid of, as the smallest piece of root left in the ground multiplies rapidly.

The process of extracting the farina is very simple, and the ordinary housewife finds no difficulty in obtaining the starch from the fresh roots. These are first washed. They are then grated on an ordinary grater into a pan or vessel of water. The pulp is thoroughly stirred in the water in order to separate the starch cells from the fibrous portion. The vessel containing the grated roots is now set aside for a short time to allow the starch cells to settle. These cells being heavier than the fibrous portion, sink to the bottom. The water containing the débris can now be poured off and fresh water added. The starch and fresh water are well mixed together and then set aside for the starch to settle as before. This washing process may be repeated a number of times. The more thoroughly the starch is washed the purer it becomes.

Owing to the limited demand for arrow-root the plant is not cultivated much in Florida. Many of the negroes raise it on their small farms in limited quantities in order to obtain starch for laundry purposes. The supply can, and doubtless will be, always equal to the demand.

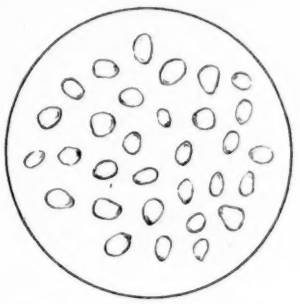


Fig. 2.—Starch cells, Arrow-root.

CASSAVA.

"Cassava" belongs to the family of euphorbiaceæ, and the bitter variety of Brazil (*Manihot utilissima*) is said to contain a large per cent. of hydrocyanic acid.

The sweet variety is indigenous to both Africa and the West Indies. From the last it was introduced into Florida under the name of "cassava" (also aboriginal).

The wild variety was eaten by the South American and Caribbean Indians centuries before this country was discovered by Europeans. In Brazil today mandioca is as much in use as wheat and corn in the United States.

The Indian mode of preparing the roots for food, in vogue nobody knows how many centuries before the first Spaniard or Portuguese came to the country, has not been much improved upon. With a shell or a rude grater made by setting a small sharp stone into a bit of bark, the roots are scraped to a fine pulp. The pulp is then rubbed between stones until all the poisonous juice is squeezed out, and the remaining moisture evaporated by exposure to the fire or hot sun. During the drying it is stirred or broken into coarse grains. This is the farina or mandioca flour, the bread of the rural Brazilians. The Portuguese invented mills for preparing mandioca, not unlike Yankee cider presses. The roots are first washed and then the rind is removed. Then the pieces are held in the hand, in contact with a circular grater.

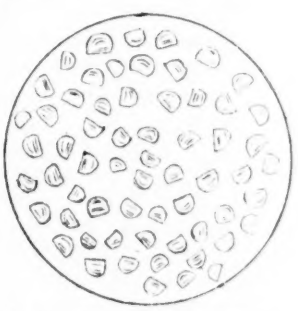


Fig. 3.—Starch cells from Cassava.

The pulverized material is placed in sacks, several of which are subjected to the action of a screw press, or they are suspended from a pole and weights attached to them. These processes cause the expulsion of the poisonous fluid. The mass thus treated is next beaten fine in a mortar. It is now transferred to open ovens

and stirred constantly until thoroughly dry. When properly prepared, the farina is very white and beautiful.

Mandioca is said to have medicinal virtues. A poultice made of the grated pulp and moistened with the juice, is considered a cure for abscess. A drop or two of the poisonous juice is administered for tape-worm. But it is principally with the sweet variety or true cassava grown in Florida that the reader is most interested. It is undoubtedly destined to take high rank as a food plant not only on account of its richness in starch, but also from its enormous yield under proper cultivation. It is said to yield 600 bushels per acre, while sweet potatoes (or yams) yield but 500 under the same conditions.

The following is the United States Department of Agriculture analysis:

Water	70.44 per cent.
Ash	.57
Oil and fat	.38
Glucose	.28
Sugar	5.19
Crude fiber	1.19
Nitrogenous bodies	1.03
Starch	21.24

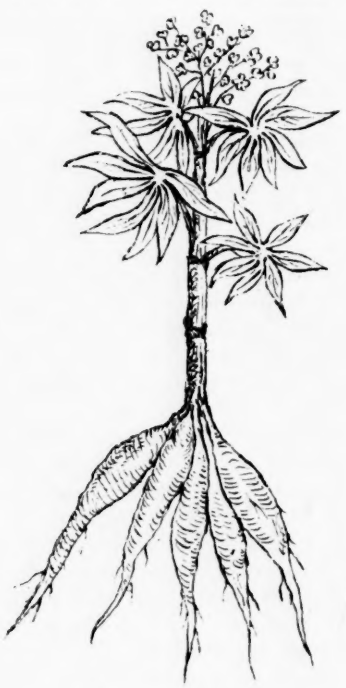


Fig. 4.—Cassava Plant.

Sweet cassava (*Manihot aipi*, Pohl.) abounds in a milky non-poisonous juice. The roots are grated the same as the bitter variety and the juice extracted.

The resulting farina consists largely of broken cell-walls containing a certain quantity of starch. The farina or meal is dried on plates, and is made into cassava cakes. The liquor, which passes away under pressure, contains a large amount of starch. This may be recovered if the liquor is allowed to stand until settled, when the liquid portion can be poured off, and the starch reclaimed. (Fig. 3.)

In the illustration it will be seen that the starch cells are muller-shaped. Tapioca is prepared by heating moistened cassava starch on hot plates.

This process alters the starch cells, causing them to swell up, many of them bursting and agglomerating in small irregular masses. Tapioca is not pure starch. By the process adopted part of the starch is changed into gum; there are also traces of sugar to be found in tapioca.

In the liquor that is poured from the deposited starch much gum and some albumin may be obtained.

The illustration shows the entire plant. It is not propagated either from the root or seed. Pieces of the stalk are planted and from the buds grow the future plants. In this way sugar cane is also propagated.

KOONTI.

This plant (*Zamia intregrifolia*) is a native of South Florida, and is called "Indian Bread-root." In its foliage it bears a resemblance to the palm and tree fern. In affinity it is nearer the latter than the former. Figure 5 represents the appearance of the plant. Its root is the edible portion.

When the poor whites on the east coast are greatly in need of money they go to the woods and dig koonti, finding a ready market for the roots. Indeed, it is the sole occupation of many people. The roots are not cultivated, as they grow wild in great abundance. A very fine quality of starch and tapioca is manufactured from them, which may be found at all times in the Key West market.

Figure 6 shows the appearance of the starch cells of

Figure 5.

koonti. They are muller-shaped, like those of cassava, but smaller. The starch is said to be equal to the best Bermuda arrow-root, and lately its worth as an article of commerce has been fully recognized in Florida. There are a number of factories for its preparation in Southern Florida. A correspondent of the United States Agricultural Department writes: "I ate of a koonti pudding, at Miami, and can say that, as it was there prepared and served, with milk and guava jelly, it was delicious."

The unique industry (in the more limited sense of the word) of the Seminole is the making of the koonti flour. The Indian process is this. The roots are gathered, the earth is washed from them, and they are laid in heaps near the "koonti log." The koonti log, so-called, is the trunk of a lage pine tree, in which a number of holes, about nine inches square at the top, their sides sloping downward to a point, have

been cut side by side. Each of these holes is the property of some one of the squaws or children of the camp. For each of the holes, which serve as mortars, a pestle made of some hard wood is furnished.

The first step in the process is to reduce the washed koonti to a kind of pulp by chopping it into small pieces and filling with it one of the mortars, and pounding it with a pestle. The contents of the mortars are then laid upon a small platform; each worker has one. When a sufficient quantity of the root has been pounded, the whole mass is thoroughly saturated with water, in a vessel made of bark. The pulp is then washed in a straining cloth, the starch of the koonti draining into a deer hide suspended below. When the starch has been thoroughly washed from the mass, the latter is thrown away, and the starchy sediment in the water left to macerate. After some days the sediment is taken from the water and spread upon palmetto leaves to dry. When dried, it is a yellowish white flour, ready for use.

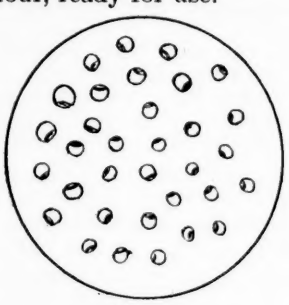


Figure 6.

In the factories this process is substantially followed but with improved appliances. The chief variation being that the koonti starch undergoes several successive macerations, thereby making it purer and whiter than the Indian product.

The koonti bread made by the Indians is of a bright orange color. It is rather insipid, though not unpleasant to the taste. It is made without salt. Its yellow color is due to the fact that the flour has had but one maceration.

A STUDY OF THE DEFORMITIES OF THE JAWS AMONG THE DEGENERATE CLASSES OF EUROPE.

BY EUGENE S. TALBOT, M.D., D.D.S.
FELLOW OF THE CHICAGO ACADEMY OF MEDICINE.
CHICAGO.

The Twelfth International Medical Congress in Moscow, afforded me a long-sought-for opportunity, not merely to visit Russia, but also to cover nearly all the countries of Europe. In visiting the various cities I made special observations of the degenerates in each of the various institutions for the defective classes. The objective points of interest were the prisons, insane hospitals, schools of idiocy, foundlings' homes, etc. The features of the soldiers, police and cabmen, as well as the citizens themselves, were incidentally noted for the purpose of comparison. These observations, however, were for an entirely different purpose, the object of this paper being to record results as to the deformities of the jaws and teeth of the mature degenerate classes.

In a prison in Athens containing 452 convicts, not a single V or saddle arch was found, although slight irregularities of the teeth due to local causes were observed. Arrest of the lower jaw, however, was the rule, which together with the recession of the forehead gave to the individual an idiotic appearance. Irregularity, in the relation of the upper to the lower jaw due to excessive and arrest of development, was very common. The third molars, upper and lower, were present, but the vault was lower than the average.

In a Greek insane hospital (idiots are here confined with the insane), in Constantinople, of 332 inmates (equally divided as to sex) only one case of V-shaped arch was noted. The vaults were low, upper jaws large and full, but 48 per cent. of the lower jaws arrested, the third molars normally developed.

In an Armenian insane hospital (idiots are here confined with the insane) in Constantinople, of 250 inmates (175 males, 75 females) there was one partial V-shaped arch, the third molars normal, and the lower jaw arrested in 18 per cent. There were many mongoloid faces.

In the Vienna Insane Hospital, among 326 insane and idiots there were 4 partial V and 1 saddle-shaped. The third molars were normally developed in 311 cases.

In a prison in Moscow, with 2,000 convicts (247 of which were in the hospital) there were no contracted jaws nor irregularities of the teeth. The jaws were very large and vaults low. In the Moscow Reform School, 112 boys were ranging from 10 to 18 years. Three had partial V-shaped arches; no saddle-shaped arches. The jaws, as a rule, were large and broad with low vaults.

In a Moscow insane hospital with 400 patients, of which 12 were idiots, no contracted arches were observed. The jaws were large and broad with low vaults.

In the Stockholm Insane Hospital, with 270 patients, 6 V-shaped arches, 12 partial V, 4 semi V, 23 saddle-shaped, 4 partial saddle, 11 excessively developed upper jaws, 3 excessively developed lower jaws, 9 hypertrophy of the alveolar process, 42 missing third molars, 6 missing laterals were noted. Deformities of individual teeth were numerous.

The School of Idiocy of Stockholm with 120 inmates, 80 boys, 40 girls, gave the following results:

BOYS.	GIRLS.
14 normal jaws.	15 normal jaws.
12 V-shaped.	1 V-shaped.
10 partial V-shaped.	5 partial V.
4 semi V-shaped.	5 semi V.
8 saddle-shaped.	8 saddle-shaped.
1 partial saddle.	1 semi-saddle.
2 semi-saddle.	6 macrocephalic.
12 macrocephalic.	4 microcephalic.
5 microcephalic.	

Thirty-two boys and fourteen girls had hypertrophy of the alveolar process on the upper jaw. One boy, aged 13 years, who was able to take care of himself, had a head thirty-two inches in circumference, one of the largest on record. The prison at Hamburg had 1800 convicts. Large, well-developed jaws were the rule. Asymmetry in development, however, was frequently noticed as well as other stigmata.

The School of Idiocy at Hamburg had 600 children, 396 boys, 204 girls, and gave the following results:

BOYS.	GIRLS.
62 normal jaws.	28 normal jaws.
12 V-shaped.	4 V-shaped.
16 partial V.	7 partial V.
8 semi-V.	3 semi-V.
4 saddle.	1 saddle.
3 partial saddle.	1 partial saddle.

2 semi-saddle.	3 semi-saddle.
46 hypertrophy of alveolar process.	25 hypertrophy of alveolar process.
3 macrocephalic.	5 macrocephalic.
4 microcephalic.	2 microcephalic.

One boy of 13 years had an excessive lower jaw, being one and a half inches beyond normal upper, a most remarkable case.

In the Insane Hospital and School of Idiocy at Amsterdam, there were 1330 insane, 255 idiots. In the insane no contracted arches were found. Vaults were low; 67 had hypertrophy of the alveolar process. No third molars were missing.

IDIOTS.

116 males:	139 females:
1 V-shaped.	1 V-shaped.
3 partial V.	2 partial V.
1 semi-V.	
1 saddle.	

There was hypertrophy of the alveolar process in nineteen. The vaults were low and jaws well developed.

The School of Idiots, Paris, 667 inmates, 500 boys, 167 girls, gave the following results:

BOYS.	GIRLS.
1 V-shaped.	1 V-shaped.
40 partial V-shaped.	6 partial V-shaped.
2 semi-V.	1 semi-V.
2 saddle.	8 saddle.
1 partial saddle.	2 partial saddle.
4 semi-saddle.	1 semi-saddle.
7 hypertrophy of alveolar process.	4 hypertrophy of alveolar process.

The vaults were low.

Having permits to visit the following prisons in Paris, Ci-aprie, Le Depot, Grande Roquette, Mazas, La Santé, St. Pélagie and San Lazan, after examining the convicts in the first four, aggregating 2600, I abandoned the task, since no deformities of the jaws of special value were observed.

In England I examined the following public asylums: 1. Earlswood, Red Hill, Surrey. 2. Darenth School for Children. 3. Darenth School for Adults, Hanwell Hospital for the Insane and the following private institutions: 4. Mrs. Langdon Down. 5. Dr. Shuttleworth. 6. Dr. Beach. A day was spent at the Criminal Insane Hospital, Broadmore. Fully one-half the inmates were so violent that the task was given up. Enough, however, was observed to warrant my stating that fully 80 to 85 per cent. had marked deformities of the jaws and teeth.

Hanwell Hospital for the Insane, Southall, has 2080 patients, mostly of the dependent class, who went insane after maturity; hence the class of deformities which are under discussion were not common. Hypertrophy of the alveolar process and excessive and arrested development of the jaws were, however, frequently noticed. Stigmata of degeneracy of head, face, eyes, ears, body, hands and feet were the rule.

Earlswood Idiot Asylum, Red Hill, Surrey, contained 670, of which 400 were boys and 270 girls.

BOYS.	GIRLS.
31 normal jaws.	24 normal jaws.
108 V-shaped.	67 V-shaped.
69 partial V.	86 partial V.
11 semi-V.	24 semi-V.
19 saddle.	
27 partial saddle.	8 partial saddle.
13 semi-saddle.	23 semi-saddle.
	1 cleft palate.
104 Marked arrest of upper jaw.	87 Marked arrest of upper jaw.
64 marked protrusion of upper jaw.	24 marked protrusion of upper jaw.
11 marked protrusion of lower jaw.	1 marked protrusion of lower jaw.
306 marked arrest of lower jaw.	237 marked arrest of lower jaw.
46 lateral incisors arrested.	30 lateral incisors arrested.
28 lateral incisors lost.	16 lateral incisors lost.
180 third molars lost.	85 third molars lost.
160 showed malnutrition of teeth.	78 showed malnutrition of teeth.

Darenth School for Idiots, Dartford, Kent, had 1000 inmates, 640 boys and 360 girls.

BOYS.	GIRLS.
150 normal jaws.	90 normal jaws.
143 V-shaped.	118 V-shaped.
140 partial V.	80 partial V-shaped.
105 semi-V.	65 semi-V.
35 saddle.	
20 partial saddle.	8 partial saddle.
10 semi-saddle.	20 semi-saddle.
450 marked arrest of upper jaw.	310 marked arrest of upper jaw.
150 marked protrusion of upper jaw.	90 marked protrusion of upper jaw.
23 marked protrusion of lower jaw.	9 marked protrusion of lower jaw.
600 arrest of the lower jaw.	340 arrest of the lower jaw.
68 lateral incisors arrested.	32 lateral incisors arrested.
42 lateral incisors lost.	19 lateral incisors lost.
388 third molars lost.	111 third molars lost.
150 hypertrophy of the upper jaw.	90 hypertrophy of the upper jaw.

Darenth School for Adults (idiots), Dartford, Kent, contained 1050 inmates, 450 males, and 600 females.

MALES.	FEMALES.
60 normal jaws.	40 normal jaws.
105 V-shaped.	177 V-shaped.
93 partial V.	121 partial V.
53 semi-V.	79 semi-V.
31 saddle.	
5 partial saddle.	8 partial saddle.
	10 semi-saddle.
295 marked arrest of upper jaw.	436 marked arrest of upper jaw.
162 marked protrusion of the upper jaw.	209 marked protrusion of the upper jaw.
8 marked protrusion of the lower jaw.	17 marked protrusion of the lower jaw.
409 arrest of lower jaw.	580 arrest of lower jaw.
48 lateral incisors arrested.	72 lateral incisors arrested.
37 lateral incisors lost.	62 lateral incisors lost.
442 third molars lost.	597 third molars lost.
58 hypertrophy of upper jaw.	36 hypertrophy of upper jaw.

Of the children, 576 boys and 282 girls showed malnutrition *in utero*. Of the adults, 396 males and 578 females showed malnutrition *in utero*.

Mrs. Langdon Downs' School for Idiots, Normansfield, Hamptonwick, contained 147 inmates, 97 boys and 50 girls.

BOYS.	GIRLS.
12 normal jaws.	5 normal jaws.
36 V-shaped.	10 V-shaped.
20 partial V.	9 partial V.
15 semi-V.	12 semi-V.
9 saddle.	7 saddle.
13 partial saddle.	1 partial saddle.
28 semi-saddle.	16 semi-saddle.
86 arrest upper jaw.	45 arrest upper jaw.
92 third molar missing.	47 third molar missing.
16 lateral incisors missing.	8 lateral incisors missing.
46 teeth showing arrest and grooves.	21 teeth showing arrest and grooves.
19 hypertrophy of alveolar process.	7 hypertrophy of alveolar process.

Of the twelve normal dental arches (males) seven were hypertrophied. Of the five normal dental arches (females) three were hypertrophied.

Dr. Shuttleworth's Private Idiot School, Richmond Hill, had twelve boys and girls. There was one normal jaw, but no laterals. There were two V-shaped,

five partial V, one semi-V, two partial saddle, and one semi-saddle shaped jaw. Four had hypertrophy of alveolar process; nine had notched and pitted teeth, and all high vaults. These patients were too young to decide as to the number of third molars, but five had one or both laterals missing.

Dr. Fletcher Beach, Winchester House, Kingston Road, had thirteen patients: Three V-shaped, eight partial V and one semi V-shaped jaw; six hypertrophy of alveolar process; eight had notched and pitted teeth; all high vaults. These patients were also too young to decide as to the number of third molars. Four had one or both laterals missing.

These reports are tabulated in the order in which they were made. They show a gradual increase degeneracy from the examinations made in Greece to those in England. It will also be noticed that the deformities of the jaws and teeth are more numerous among the better classes, such as are shown in the private institutions of Mrs. Langdon Down and Drs. Shuttleworth and Beach, than those of the poorer classes in the public institutions of England.

From examinations previously made in Spain, Italy and Switzerland among the degenerate classes, a very small percentage of deformities of the teeth and jaws were found. As compared with the American born degenerate classes, the percentages are greater than those of the Latin races, and the Slavs, Germans, Austrians, Danes and Dutch, but less from 25 to 30 per cent. than the Swedes and English.

These observations have proven to me what I long ago suspected from my studies of the degenerate classes which have come to America, and which fill our public charitable institutions as well as our prisons, that the higher the intellectuality the greater the degeneracy of the jaws and teeth.

SOCIETY PROCEEDINGS.

The Mitchell District Medical Society of Indiana.

Semi-annual meeting held at West Baden Springs, Dec. 27, 28 and 29, 1897.

The meeting was called to order by Dr. J. GARLAND SHERRILL, the president. After transacting routine business, the first paper, entitled

INJURIES OF THE HEAD,

was read by Dr. JOHN F. POTTS of Bloomington, Ind.

After some general observations on the subject of extensive depressed fractures of the skull, Dr. POTTS illustrated his point by reciting the case of a man 53 years old, who, Jan. 22, 1897, sustained a fracture of the left parietal and temporal bones, which were crushed in, involving the extremity of the frontal bone and leaving a large opening through which a considerable mass of brain substance protruded. Careful removal of the depressed bone left a very large area of exposed brain substance exuding through the lacerated meninges. The patient recovered consciousness and did fairly well until February 26, when he was seized with a severe chill. On the night of the 27th convulsions came on. March 1 a large mass protruded through the opening. The most prominent part of the swelling was punctured by the exploring needle, without results. The patient's condition was such that incision was deemed necessary to determine the cause of the swelling; a large amount of pus escaped and the convulsions ceased. From this time on the patient advanced in convalescence, finally making good recovery. The left eye was blind and the pupillary reflex presented a yellowish pink color. The patient claimed to have perception of light. Dr. Potts thought injuries of this character, in which the skull was crushed in, although involving one whole side of the head, as this did, and making it necessary to take out an enormous amount of the cranial wall, frequently resulted fatally for the lack of complete removal of depressed bone, regardless of the area involved. He wished to know if any of the members present could account for the loss of sight and the peculiar pupillary reflex in the left eye.

Dr. PFINGST felt satisfied that the injury of the eye was due to embolism in the choroidal vessels, causing inflammation of the vitreous humor.

Dr. WM. V. MORGAN thought septic infection sufficiently explained the condition described. General inflammation of all the structures of the globe, he had no doubt, resulted from infection of the wound in the brain. Dr. Morgan pointed out the difficulty in ordinary cases of severe injuries to the head in determining the presence of fracture of the bone, because of the hard, sharply defined, marginal outline of the site of the injury. In severe contusions of the scalp this sharply defined outline is so abrupt and so hard to the sense of touch as to present all the physical characteristics of depressed fracture. He thinks great danger of confining infectious matter may result from too early suturing of the dura mater. Secondary hemorrhage is another source of danger. He recently had three cases of depressed fracture, with loss of brain substance, in all of whom serious hemorrhage was present, yet recovery was secured by the prompt control of the hemorrhage by packing with iodoform gauze and maintaining ample drainage. In all of these cases small abscesses requiring puncture occurred. He thinks Rolando's fissure the frequent site of hemorrhage. Large clots forming in this fissure require to be turned out and in order that it may be properly exposed it is of the first importance that it should be accurately located externally. His method of locating the fissure of Rolando consists in taking a tape, with which he measures from the most inferior part of the external auditory meatus, in a directly vertical line over the saggital suture, and then placing the lower end of the tape in the nasal notch of the frontal bone, he extends it directly back along the median line, resting the superior end of the tape, which marks the distance from the inferior auditory meatus to the median line, firmly upon the head, the lower end is now swept to the outer border of the malar bone; the upper three-fifths of the tape then lies over Rolando's fissure.

Dr. J. GARLAND SHERRILL considers it the first duty of the surgeon to ascertain the extent and character of the injury, without waiting for symptoms of pressure. Delayed exploration allows time for organic changes to take place in the brain substance, which leads to cicatricial formations, followed by epilepsy, and sometimes even more serious results.

Dr. CHARLES P. COOK of New Albany reported the case of a man who had been sandbagged and in whom no symptoms of local injury, excepting swelling, existed. The sharp marginal outline of a contused scalp was absent. The nature of the injury was completely masked until symptoms of compression became marked. Operative interference was not permitted and after a tedious and prolonged course of medication the patient made final recovery.

Prof. WM. V. MORGAN cited the rules laid down by Dr. Agnew for determining injuries to the brain when no objective symptoms are present. He then related the important features of a case of laceration of the sigmoid portion of the lateral sinus, in which early operation was done. The patient was a boy who had been kicked in the head by a horse. Foreign matter was carried into the wound. On elevating the depressed bone a frightful hemorrhage occurred, which was controlled by packing with iodoform gauze. On the third day, when the packing was removed the hemorrhage recurred and death seemed imminent. Repacking, however, finally succeeded in arresting it. On the seventh day, when the second packing had been removed, it was found that the lateral sinus had been cut half in two.

Dr. E. P. EASLEY of New Albany saw a case with Dr. Chas. Cook in which the fracture extended below the ear, involving the base of the occipital bone. The depressed bone was carefully removed, posteriorly below the mastoid and the patient made complete recovery.

Dr. SHERRILL thinks shaving the head removes the chief obstacle to the discovery of objective signs of fracture, where the soft parts remain unbroken.

Dr. A. W. BRAYTON recited Phelps' published list of 300 detailed cases, in nearly all of which symptoms of depression lead to the localization of the site of injury, yet in some cases this is not possible. In a case where no symptoms of external injury existed, the patient died from pressure of a blood clot.

Dr. SHERRILL reported an interesting case of death, resulting from cerebral apoplexy, due to atheroma, in which a fall was supposed to have produced concussion with fatal result, when, in fact, loss of consciousness actually preceded the fall.

Dr. EASLEY of New Albany reported a case where a blow on the head, which produced no external sign of injury, was followed by hemorrhage from the middle meningeal artery, resulting in death.

DECEMBER 28, 9 A.M.

Dr. WM. D. PENNINGTON of West Baden read a paper on "Acute Gastritis." In a majority of such cases the more serious structural changes take place in the pyloric region. Nearly all cases of acute gastritis are due either to microphytic causes, or the presence of insoluble matter or concentrated alcoholic drinks. The differentiation is generally sufficiently easy by the aid of microscopic analysis. Apomorphia and syrup of ipecac are the best emetics in cases of retained insoluble matter. In the treatment of all forms of acute gastritis he esteems saccharated mercury, limiting the patient's diet to skimmed milk as long as any inflammation is present.

Dr. SYMON P. SCHERER of Indianapolis considered the early employment of lavage most important. This should be repeated at least once per day, with sterile water containing a small quantity of bicarbonate of sodium. At first the stomach should be washed two or three times to insure thorough emptying and cleansing. In cases of ectasia he finds ingesta remaining in the stomach for twenty-four hours. He insists upon the value of lavage in all cases of gastritis and in atonic dyspepsia, with or without gastralgia. He would not, in ordinary cases, allow the patient to use the stomach tube without the presence of a trained nurse or the physician himself.

Dr. J. GARLAND SHERRILL insists upon some discrimination as to the cause of the gastritis. He maintains that the same treatment can not be applied in all casses of microphytic inflammation and those arising from caustic alkalies. In the latter class of cases no food should be introduced into the stomach, feeding should be done entirely per rectum. Lavage in such cases must necessarily aggravate the patient's discomfort. He thinks medicinal treatment in such cases should be limited to fluids that have some local anesthetic or anodyne properties.

Dr. E. P. EASLEY would not use the tube in acute cases, after once emptying the stomach. He does not doubt the value of repeated lavage in chronic catarrhal gastritis. The apparatus, however, and its mode of use are obstacles to the employment of that method in private practice. Poor people can not afford the apparatus and no untrained person can be trusted to use it.

Prof. WM. V. MORGAN of Indianapolis suggests that a perfectly satisfactory apparatus can be constructed of a plain piece of rubber tubing, by first trimming and then sandpapering the end of it so as to round it and make it perfectly smooth. After carefully washing off any adhering foreign matter that may have become attached to the rubber in the process of smoothing it, attach a common funnel to the other end of the tube. The rubber should be three feet in length with an aperature of one fourth of an inch. In many chronic cases the repeated employment of lavage is of the greatest service.

Dr. WM. D. PENNINGTON fully endorsed the device of Professor Morgan.

Dr. ADOLPH PFINGST of Louisville read a paper on "Middle Ear Complications in the Course of Measles." He reported the case of a child in whom sudden high temperature continued for several days, and which had been preceded by very slight discomfort of one ear only. When he was called to the case, both external drumheads were swollen and bulging. Hearing by the watch test = 4/xxx. Hot poultices resulted in the rupture of both membranes and the free dischage of pus. The absence of pain in otitis media, occurring in the course of measles, seems to be as commonly observed as the sudden onset of high temperature. In Bezold's cases many died without having such symptoms as to attract attention to the ear, yet autopsy showed indurated lining of the drum cavity, and in some the ear drum was filled with pus. Dr. Pfingst concurs in the opinion that infection is sometimes carried by the air into the tympanum; at other times tympanic disease is the result of infection by contiguity of structure. He believes that measles rarely runs its course without provoking some form of otitis media, the purulent form being the most frequently observed.

Dr. ULRICH H. HON of Bloomington called attention to the fact that the eruption of measles is present in all the mucous membranes as well as the skin, and he has no doubt it is present in the middle ear as well as the fauces, where it is always well marked. He has often observed suppurative otitis appearing simultaneously with the decline of the eruption in the skin.

Dr. JOHN F. BARNHILL of Indianapolis called attention to the unfortunate failure to recognize the ear complication sufficiently early to prevent suppuration, and such deep seated organic changes as to permanently impair the hearing. The narrow Eustachian canal is early closed by accumulating mucus, which will soon be observed to undergo suppurative changes. He thinks shutting out the circulating current of air nearly always leads to suppuration of the retained mucus in cases of measles.

Dr. PFINGST accepts Dr. Barnhill's explanation of the cause of suppuration.

Dr. JOHN F. BARNHILL read a paper on "Extrapulmonary Coughs." Reflex causes are found in impacted cerumen, eczema of the external auditory canal, nasal obstructions, diseases of the pharynx, and a dripping from the vault of the pharynx into the larynx. The ear, nose and pharynx must be explored in all cases, searching for retained matter, inflamed areas, morbid growths, enlargement of the inferior lobes of the tonsils, concretions in the upper lobes of the tonsils, and various conditions of the epiglottis. Sometimes cervical tumors pressing on the vagus excite cough. He related cases due to deformities of the septum narium, with adenoid growths in the posterior nasal spaces; small tumors on the base of the tongue which irritate the crest of the epiglottis; elongated uvula; and some cases of neurotic persons in whom no local morbid conditions could be discovered.

Dr. DUDLEY S. REYNOLDS called attention to the occasional development of horny growths in the tonsils, in the posterior wall of the pharynx and on the base of the tongue. He recited the case of a woman, who for a long time attended his clinic at the Hospital College of Medicine, and in whose throat there were a large number of filiform bodies resembling hair. They were about one sixteenth of an inch in diameter, three-fourths of an inch long, of symmetric growth, cylindric in form, with sharp-pointed extremities. They presented a dark muddy brownish color. They were removed with great difficulty, and when subjected to microscopic examination, turned out to be veritable horns, having all the characteristics of ordinary horny tissue. These growths resisted the action of caustics, the patient having been the rounds of other clinics for several years. She had a harassing cough. Dr. Reynolds found it very difficult to pull out these growths with the forceps. By seizing a number of them with serrated forceps, and cutting out the matrix with scissors, the growths were exterminated in sections, the second operation being delayed until cicatrization had taken place in the area embraced by the first, and so on to the conclusion. While such cases are not very common, they occur sufficiently often in the course of his practice to deserve mention among the causes of extrapulmonary coughs. They are in no sense of the word like either the milk-tinted masses of fungus disease, nor by any possible mistake in diagnosis to be compared with the ordinary concretions found in the little pouches, or dilated sinuses of the tonsils.

Dr. SCHERER reported a case of horny growths occurring in his practice, which he relieved by cutting out the matrix with scissors.

Dr. A. W. BRAYTON complimented Dr. Reynolds on his description of the growths, but insisted that the disease which produced them is nothing more than a mycosis. Such cases he regards as of sufficiently common occurrence to be considered in the list of causes of extrapulmonary coughs. He referred to an able essay on the subject by Dr. Klein of Indianapolis, presented to the Marion County Medical Society. Dr. Brayton remarked that, although the disease is a distinct mycosis, the action of strong acids is not sufficient to dissolve the growths. He does not doubt that many of them are really horny in formation and believes that the actual cautery is often the best agent for removing them.

Dr. PFINGST thought the massing of the pavement epithelium and the hair like appearance of the growths resulted from the tenacious adherence of the flattened cells.

Dr. CHARLES P. COOK had observed a peculiar cough, and a morbid sensibility of the throats of beer-drinkers, in some of whom milk-white bodies were present in the tonsils.

Dr. BARNHILL thinks the beer-drinker almost always exhibits varicose veins at the base of the tongue. He finds them also in neurotic and anemic women, about the period of the menopause. He has, in some cases, been obliged to puncture the varices to give relief to the distressing cough. Varicose veins in the space between the tongue and the epiglottis are most annoying.

Dr. SIMON P. SCHERER read a paper on

HEART MURMURS.

He thinks the habitual use of digitalis by physicians who do not regard the methods of physical investigation of conditions of the heart, and who divide heart murmurs into two general classes, often leads to grave consequences. The tabular location of normal heart sounds affords the only reliable means of comparison, either in deviation of position with reference to the character of the murmur, or the relations these bear to the systolic and diastolic movement. The comparison of both location and character of murmur in diastole or systole with synchronous pulsations of the carotid, afford in many cases the only means of diagnosis. If weak left ventricle with mitral

insufficiency, can be made out, digitalis may be used. Where muscular tonics, however, are required, strophanthus and strychnin are the most reliable agents. In some cases of aortic stenosis, with hypertrophy of the left ventricle and mitral insufficiency, the tincture of aconite, cautiously administered until the apex beat against the chest wall is reduced to a point of relief, great good may be accomplished. In this state of affairs digitalis does harm. In mitral stenosis, digitalis is indicated. In all atonic cases, strophanthus and strychnin; where venous stasis is present, salines and mercury should follow or accompany the use of strophanthus. The prolonged use of strophanthus shows no tendency to cumulative effects. The tincture in five to eight minims doses gives the most uniform results.

Dr. THOMAS EASTMAN of Indianapolis believes that great care and precision of method in diagnosis is essential in the treatment of the various forms of cardiac disease. He would like to emphasize his preference for the tincture of nux vomica or the extract, in all cases where strychnin is indicated. He considers that all other alkaloids of the nux vomica of greater value, are sacrificed by the substitution of strychnin. As a matter of preference he regards the tincture of nux vomica as superior to all other preparations.

Dr. J. GARLAND SHERRILL has seen bad results from the prolonged use of digitalis, which he considers of great power for good or evil. He has known arteritis follow its use.

Dr. WM. V. MORGAN of Indianapolis considers that painstaking care in diagnosis will alone enable the practitioner to exercise sound judgment in the choice of remedial agencies. He reported a case of tuberculous cystitis, with hydronephrosis, which caused hypertrophy of the heart. If the cause can be removed, the compensating dilation of the heart should arouse no anxiety in the search for cardiac remedies.

Dr. G. W. BURTON of Mitchell does not think errors of diagnosis easily avoided. In his experience of forty years' practice he has occasionally found it impossible to make an entirely satisfactory diagnosis. He has no confidence in any tincture of digitalis, in fact he questions the value of any preparation, excepting the infusion alone. He has found the tincture of strophanthus an important though powerful and, therefore, dangerous agent. He has known it to do mischief in the hands of inexperienced practitioners. If all the difficulties in diagnosis could be mastered, then he would say cardiac lesions might be treated upon principles entirely satisfactory and rational.

In concluding the discussion, Dr. Scherer called attention to the aggravated dangers of cardiac medication in all forms of hypertrophy complicated with renal disease. As to the question of the best preparation of digitalis, he thinks most practitioners now prefer digitalin. In the choice of preparations of strophanthus he regards the tincture made by Parke, Davis & Co. as the most reliable and, therefore, the best preparation. He does not think the dose should exceed 5 minims to begin with. He thinks the profession in general is inclined to underestimate the value of aconite for diminishing tumultuous and rapid heart action.

Dr. DUDLEY S. REYNOLDS of Louisville introduced the subject of

CHOROIDITIS IN CHILDREN.

He maintains that many cases are overlooked in prescribing glasses for the correction of optic defects, and that disastrous results often follow. He contends that choroiditis in children is to be regarded as a manifestation of blood taint, or of that character of defective tissue growth found in mixed races. He is persuaded that very few mulattoes may be found entirely free from choroidal disease. From his limited opportunities of observation, he has reached the conclusion that those persons of mixed blood, of African paternity, with predominating Caucasian blood on the maternal side, never escape choroidal or retinal disease. Dr. Reynolds thinks the axial choroiditis of the aged, like that of infants, may arise from the imprudent exposure of the eyes to prolonged brilliant illumination. The disseminate choroiditis coming on at any period in life, he regards as distinctly characteristic of syphilis. He does not think it is often seen in cases of acquired syphilis, although he does think it sometimes appears late in life in acquired cases. He urges the necessity of having the eyes of every child carefully examined with the ophthalmoscope before permitting it to engage in the duties of school life.

Dr. ULRICH H. HON of Bloomington expressed great satisfaction with some of the conclusions of the essayist. He recited instances occurring in his own observation where the eyes of school children had been permanently impaired, and in some cases practically lost after the adjustment of glasses by itinerant opticians. He has known many cases where subsequent examination by expert ophthalmic practitioners disclosed irremediable disease of the choroid and retina. He is satisfied that the importance of the matter would justify the expense and trouble incident to a thorough examination of the eyes of all children before going to school.

Dr. J. F. BARNHILL of Indianapolis deprecates the too common practice of permitting opticians to adjust glasses, without ever stopping to consider the conditions of the structures within.

Dr. EDMUND D. LAUGHLIN of Orleans, feels that something out to be done to prevent the practice of traveling opticians, often armed with certificates from prominent physicians, adjusting glasses to the eyes of every one who has sufficient money to pay for them. It is clearly the duty of the medical profession to aid both in devising adequate laws for the prevention of such criminal practice, and the enforcement of such laws as we already have. Until some united action on the part of the regular profession is taken, we shall be obliged to continuously witness the disastrous results of allowing itinerant opticians to tinker with the eyes of innocent children, and unsuspecting parents.

Dr. U. H. HON related the case of a modest, upright young man who had spent several months at some kind of school in Chicago, which issued a diploma or certificate of qualification, and which the young man used as an advertising circular to obtain patients. At first he seemed to think himself able to accomplish great good in supplying glasses to people who appeared to need them. Frequent disasters following his efforts finally discouraged him, and acting upon the advice of Dr. Hon, he confessed to have discovered great mischief in some cases where he had at first thought himself justified in supplying glasses, and finally abandoned the practice and engaged in an honorable business occupation.

Dr. A. W. BRAYTON of Indianapolis felt the question raised by the essayist concerning the hereditary influence down the maternal line, constituted the most important feature of the essay. He hoped Dr. Reynolds would continue to prosecute his observations, as he felt sure much good, and perhaps some new light, would result from a continuation of these studies. Dr. Reynolds is not alone in these opinions.

Dr. REYNOLDS, in concluding the discussion, referred to a case in the person of one of the servants at the West Baden Hotel. The patient's mother had but a trace of African blood. His grandmother on his father's side was reputed to be a white woman, while his father was quite black. The patient has extensive diffuse central choroiditis, with perception of light only in one eye, and just sufficient sight in the other to enable him to go about alone. He counts fingers at ten inches only.

Prof. WM. V. MORGAN of Indianopolis, read a paper on

INGUINAL HERNIA.

He regards all the injection methods of treatment with great disfavor. He thinks they should be opposed with unrelenting energy, as they serve but to complicate matters and greatly hinder any treatment that may subsequently become necessary. Naturally all operative procedure should be such as are designed to make complete and secure closure of the abdominal rings through which the hernia passes. He thinks in old hernias no attempt at radical operative procedure should be made until after the protruding intestine has been returned to the abdominal cavity, and remained there sufficiently long to establish tolerance of the reduction, after which two methods of dealing with the sac may be considered, with such modifications as good judgment and individual experience may suggest. Kocher's method has, for its chief feature, a small incision through the aponeurosis over the internal ring, using the finger as a guide, then passing a pair of artery forceps through the opening, and bringing out at the external ring the sac, which is drawn upward and twisted, so as to lie in a furrow outside the aponeurosis, in the direction of the inguinal canal, where it is securely sutured through the fibers of the aponeurosis, external oblique muscle, and the underlying fibers of the external oblique and transversalis, through the hernial sac, and into Poupart's ligament. The sutures bring together the anterior pillars of the external ring to which the sac is fastened. If the sac is very long, that portion which extends below the external ring is cut away. The Czerny method, in addition to high ligation of the sac sutured to the anterior pillars of the external ring, may be extended to include an attachment to Poupart's ligament so as to stretch the peritoneum smoothly over the ring through which the hernia protruded. The difficulties in both this, and other methods, notably Halsted's, lies in the fact that all attempts at creating obstructions against the recurrence of the hernia, by producing thickened and elevated surfaces, create at the same time increased liability of a return of the hernia by protrusion through the depressions on each side of the artificial elevation. One of the menacing difficulties lies in the determination of the best disposition to make of the cord.

Whether it is better to transplant the testicle into the abdominal cavity by placing it within the abdominal walls, adopting Halsted's method of reforming the internal ring, bringing the transversalis fascia, and a few fibers of the transversalis muscle along with a strip from the conjoined tendon, to be stitched across the inner ring firmly to Poupart's ligament, or whether it is best to simply raise or lower the cord, are questions difficult to determine. In many cases it would be far better before operating to have the consent of the patient to the removal of the testicle on that side, and then if removal should not become necessary, no harm or delay would result in the procedure. He shares Marcy's preference for the kangaroo tendon. He considers the following points should be kept in mind both before, and at the time of operating: 1. Attention to surrounding the internal ring by an aponeurotic band. 2. Hooding the cord. 3. Suspension of the testicles. 4. Making the site of internal ring smooth by drawing the neck of the sac across it. With Kocher, he concludes the results to be obtained make it the duty of every physician to advise a radical operation in all cases of inguinal hernia, in which extraordinary size, incarceration or inflammation, or complicating disease of vital organs, or the weakness of extreme old age, do not contraindicate a resort to the knife.

Dr. THOS. EASTMAN of Indianapolis has used the shotted suture, and silver wire, besides many other materials, and would decidedly prefer the wire in all cases where it is possible to use it; the silver wire suture he thinks, is not as popular with surgeons as it should be. He thinks its antiseptic properties are not sufficiently appreciated and that its more general employment would tend greatly to allay the frequency of stitch abscess.

Dr. THOMAS EASTMAN of Indianapolis read a paper on

THE TECHNIQUE OF MINOR GYNECOLOGY.

In his opinion many of the graver conditions ultimately demanding abdominal section may be so modified, or entirely controlled by timely interference, and by proper regard for technique in the administration of palliative and preventive measures as to establish complete restoration to health. Small lacerations of the cervix, frequently regarded as utterly insignificant, lead finally to the development of cicatricial masses, imprisoning terminal nerves, and causing a great variety of reflex disturbances, sometimes leading to the development of carcinoma. Generally these lacerations are so small and insignificant as not to require suturing, but where fungoid excrescences or excessive irritability develops, the direct application of the mitigated stick of nitrate of silver may be safely, and very beneficially made. He has no doubt that the timely use of such agencies would prevent a very large proportion of those conditions which ultimately lead to hysterectomy. In recent cases of displacement of the uterus, carefully introduced tampons may be found valuable correctives. In most of the inflamed conditions of the uterus, the vaginal douche, properly employed, is capable of accomplishing great good; improperly employed, it is an instrument of evil. Three points seem necessary in the use of the douche: 1. The water should be heated to 120 or 125 degrees. 2. It should be projected directly against the cervix. 3. The quantity should never be less than one and one-half gallons. The Hildebrand douche is best because it enables one to retain for a long time the hot water of the douche in cantact with the inflamed and irritable cervix. The same may be said of ovaritis. Sometimes, in the latter condition, the tampon and electricity should be used. The faradic current is the best form, although galvanism in some cases may be desired. Many of the diseases of the Fallopian tubes, and ovaries, as well as the uterus, may be arrested in their early stages, which, if neglected, ultimately lead to the necessity of abdominal section.

Dr. SIMON P. SCHERER thinks that it frequently happens that the physician himself does not give sufficiently definite instruction as to the mode of applying the treatment. He recited an instance where he had directed the patient to take an injection for the relief of obstinate constipation. He explained that the fluid to be used should be placed in a bowl, from which it should be conducted into the bowel. Returning he found that the patient had failed in his attempt to take the injection, because he had expected the fluid to flow from the bowl into the bowel through the tube. He reproached himself for not having shown the mechanism of the instrument to be used. It often happens intelligent patients, when ill, exhibit an utter incapacity to reason about such things.

Dr. WM. V. MORGAN entertains no doubt of the value of electricity; the induced current will certainly contract the uterus. Faradic currents with coarse wire will as certainly relieve pain. It should not be forgotten the positive pole of a galvanic battery is the caustic current. As to the value of rest in delaying the development of malignant conditions there can be no question. It has often been observed that cancer of the stomach occurs, by preference, in that portion which secretes hydrochloric acid, and he has no doubt if the acid were present it would prevent the growth of malignant tumor cells.

Dr. JOHN F. BARNHILL does not see how the propping up of the inflamed organ is to be maintained without incurring the risk of adhesions to the contiguous parts and organs, and these may become sources of annoyance equally as great as those which have been pointed out as indicating the necessity for operative surgery.

Dr. EASTMAN concluded the discussion by relating a number of instances of successful palliative and preventive measures employed at the clinic of Professor Gusserow.

The report of the sanitary committee being called for, Dr. Edmund D. Laughlin of Orleans presented the following, which after some discussion was unanimously adopted:

WHEREAS, An effort is now being made to place before Congress a measure known as the Public Health Bill, formulated by a committee of the AMERICAN MEDICAL ASSOCIATION at its last annual meeting, and subsequently unanimously approved and indorsed by the American Public Health Association, at the twenty-fifth anniversary meeting, held at Philadelphia in October last; and, in view of the urgent need of such an act by the Congress of the United States, thereby creating an organic law by which the proper officers therein specified may have power to act; therefore, be it

Resolved by the Mitchell District Medical Society, that we do most heartily concur in the effort to secure the necessary legislation upon this subject, and that we will urge our several representatives in Congress to promote the passage of such an act at the earliest possible period.

Resolved, That the secretary be instructed to forward a copy of these resolutions to the representatives in Congress from the district embraced in the territory from which the Mitchell District Medical Society draws its membership.

(Signed) EDMUND D. LAUGHLIN, Chairman.

The following papers were read by title and referred for publication: "Diphtheria and Antitoxin," Cort F. Askren; "The Cystoscope in the Diagnosis of Vesical and Renal Diseases," Wm. R. Blue of Louisville; "Horse-shoe Fistula," J. Rawson Pennington of Chicago; "Some Recent Observations in the Use of Diphtheria Antitoxin," Hugh A. Cowing of Muncie, Ind.

EVENING SESSION.

The Society met in the banquet hall, President Sherrill in the chair.

An address entitled, "We Do as We Must," by Dr. Elihu P. Easley of New Albany, based on a consideration of the development of the brain, and the influences of education and environment upon the character and habits of the individual, evincing much erudition, was well delivered. It was discussed by Dr. Wm. V. Morgan, Dr. A. W. Brayton and others. At the conclusion of the discussion, Dr. Wm. D. Pennington announced, on behalf of the Committee of Arrangements, the conclusion of the program, and the banquet was inaugurated by calling upon Dr. Dudley S. Reynolds to act as toast-master. Responses were numerous, and of the usually bright and humorous character. The principal speakers were J. Garland Sherrill, Wm. V. Morgan, Simon P. Scherer, A. W. Brayton, G. W. Burton and Chas. P. Cook.

On motion, a vote of thanks was tendered to the West Baden Springs Company for many courtesies, including a magnificent menu for the banquet, and to Dr. Wm. D. Pennington for his efficient services as chairman of the Committee of Arrangements.

The Society adjourned to meet at West Baden Springs, Ind., July 20, 21 and 22, 1898.

Chicago Academy of Medicine.

Regular Meeting, Dec. 10, 1897.

Dr. A. LAGORIO in the Chair.

Dr. C. S. BACON read a paper entitled

VOMITING OF PREGNANCY.

Various theories to explain vomitus gravidarum have been advanced. A large number are theories of reflex vomiting which assume a peripheral source of irritation in some part of the genital tract. One theory assumes a stretching of the uterine fibers and disturbance of the uterus by the growing egg. G. Hewitt believed that vomiting is due to displacement of the uterus. Others assume irritation in or inflammation of the cervix with erosion of the *os externum*. Horowitz believes that inflammation of the parenchyma of the uterus is the cause of vomiting, a

view similar to that held by Veit who finds in endometritis a very important etiologic factor. Tuszkai assumes an irritation of the peritoneal coat of the uterus due to trophic disturbances following the growth of the uterus. No one of these theories can account for all cases of vomitus gravidarum and the beneficent results of treatment founded on these theories can often be explained in some other way than by admitting that such results prove the theory. The theory of Kaltenbach that hyperemesis gravidarum is due to hysteria can not explain all cases, for there are many cases in non-hysteric subjects, but there is no doubt that a psychopathic condition is a very important element in the causation of the disease. The theory of direct vomiting due solely to immediate irritation of the vomiting center by poisons circulating in the blood, or to nutritional changes caused by disturbance in the circulation in the medullary centers, can not be maintained, for reflex action can not be wholly ignored. Hence we must assume at the present time, as the only theory that will explain all the facts and make of vomitus gravidarum a single disease, one that takes account of the condition of the vomiting center and also of the sources of peripheral irritation. We must assume that in two-thirds of all cases of pregnancy there exists an increased irritability of the medullary center due wholly or in part to one or both of these two factors: 1. Nutritional changes resulting from circulatory disturbances. 2. Poisoning from toxic elements circulating in the blood. We must further assume that this abnormally irritable vomiting center is acted upon by afferent impulses sent from one or more of a variety of peripheral sources. Among the most important causes of reflex irritation are an incarcerated, retroflexed uterus, abnormal adhesions of the uterus, pathologic changes in the uterine wall resulting from endometritis, pelvic congestion, constipation, chronic gastritis, etc. To these sources of afferent impulses must be added the psychopathic or hysteric condition which is of especial importance in the more serious cases.

Much can be done to prevent the vomiting of pregnancy, especially the more serious forms, by hygienic management, which consists in caring for eating, bathing, clothing, exercise, sleep, etc., preventing constipation and especially securing a healthful mental condition of the patient.

The indications for treatment of hyperemesis gravidarum are to allay irritability of the nervous centers, combat the neuropathic condition, hysteria, and remove the sources of peripheral irritation. Since the irritability of the medullary centers is due to disturbances of the circulation, and to intoxication, the means for treating this condition are pointed out to us. For maintaining a normal circulation the horizontal position, stimulation of the cutaneous capillary circulation, use of stimulants and vasomotor regulators, and injection of artificial blood serum, are the measures which promise the most. For antagonizing the circulating toxins all measures which stimulate the renal and intestinal emunctories are indicated. The most important of these is also the salt solution. If the psychopathic or hysteric state be a factor in the vomiting it must be combatted by proper management. As in the treatment of hysteria so here it may be necessary to isolate the patient under the care of an experienced nurse and use all mental and moral forces, including suggestion. At the same time all possible sources of peripheral irritation should be discovered and removed. The constipated bowels should be carefully emptied with enemata and massage; a gastric catarrh may be treated with lavage, a displaced uterus replaced and pelvic congestion corrected by ice-bags.

Under this plan of treatment most cases can be controlled that have not advanced to the last stages of starvation. In the extreme cases the subcutaneous injection of large quantities of normal saline solution is proposed because of its effect in improving the circulation, in the elimination of toxins through the clogged emunctories, and supplying two important elements of food, water and chlorids. A case is reported to illustrate the worth of this measure.

Induction of abortion is opposed at all stages. When it is a safe measure to employ it is unnecessary, and in extreme cases it adds greatly to the danger, rarely stops the vomiting and can be substituted by the artificial serum. Three fatal cases are reported where abortion was induced without stopping the vomiting and where the operation may have been a factor in the fatal issue.

DISCUSSION.

Dr. CHARLES E. PADDOCK—I believe the cases the Doctor has quoted are instances of hysteria and we can attribute the vomiting more to this condition than any other. In other words, I believe it is more a condition of the mind than it is of any pathologic state. My experience has been that at least 90 per cent. of these cases can be cured by a little suggestion. What I mean by suggestion is the treatment advanced by the Doctor, viz., of putting the patient to bed in the horizontal position, with the assistance of a nurse. The application of nitrate of silver applied to the cervix may do some good; it may at least satisfy the patient. My treatment in these cases has always been along that line, and I find that I can stop the vomiting by such treatment. In some cases I have sent the patient to her mother, or to some relatives in the country, and I have not had a case where the emesis continued after such treatment. Nearly all of the cases I have had of vomiting of pregnancy, unless there was the existence of some pathologic condition, have been cured in a short time, if they were able to go to the places recommended by me. The other cases were pathologic. We may find an erosion of the cervix which can be treated. We may find a malposition of the uterus to be the cause. I have had cases from retroversion and retroflexion, and particularly in incarcerated cases. The treatment of these cases is plain; remove the cause and you remove the trouble. In many instances I believe they are neglected. If they are pathologic we should treat them as such, and remove the cause. I could cite several cases which I have had in my experience.

Dr. J. HOWARD SLAYTER—I have nothing further to add to what Dr. Bacon has said, except a word or two with reference to saline injections. In cases of hyperemesis gravidarum, when saline injections are necessary, we find the vitality is much lowered, and therefore these cases are especially liable to infection. In some of them we find a dropsical condition, or one analogous to it, present, and this further adds liability to infection. Again, by the use of saline injections one may, waterlog the part injected and produce an artificial dropsical condition which will be followed by increased tendency toward infection. There are cases of hyperemesis gravidarum that contra-indicate a hysteric origin, for if they were hysteric it seems to me it would be a strange thing to find a genuine organic neuritis present, although occasionally it does happen that organic disease is associated with or complicates one due to functional origin.

Dr. FENTON B. TURCK—The paper presented may be considered a fair *résumé* of our knowledge of the subject at the present time. But we had expected from Dr. Bacon's wide experience to have gained more information regarding his personal observations of the etiology of vomiting of pregnancy. If vomiting were the chief phenomenon found in so-called vomiting of pregnancy or hyperemesis gravidarum, then the theory of excitation of the vomiting center from the growing ovum may appear satisfactory, but the most prominent factor we have found is the vasomotor disturbance. Associated with the vasomotor disturbance we observe a great amount of congestion of the mesenteric vessels, accompanied with congestion of the vessels of the pelvis. The evidence of pelvic congestion may be noted as one of the early signs of diagnosis of pregnancy, and the symptoms of general vasomotor changes are soon observed. More work is demanded of the heart until an eccentric hypertrophy gradually takes place. We often find great disturbance in circulation, cold hands and feet, surface of the body cold, features drawn and blanched, lowered blood pressure, heart disturbance and sometimes syncope. The universal method of treatment is to place the patient in the prone position and the use of hot water internally, hot coffee, carbonic acid gas, as champagne, etc., subcutaneous injection of normal saline solution; these and all methods which directly or indirectly affect the vasomotor disturbance are most successful. These facts would indicate that the disturbance of the circulation is a most important factor. Where a vasomotor disturbance exists, especially of the abdominal vessels, the motor power of the stomach and intestines is interfered with and a high degree of irritability of the viscera results. If there is retention of material within the stomach and intestines from a lack of motor power, mucus accumulates, especially during the night, together with exfoliated epithelial cells, pharyngeal secretions and other products, such as toxins of bacterial origin, as well as toxins that are excreted into the stomach. These act as irritants sufficient to stimulate the so called vomiting centers.

If there is a marked degree of vasomotor disturbance of the splanchnic area there will result an increased irritability of the stomach whereby the vomiting centers receive more impulses, or are more powerfully stimulated than normally, and we may consider that the vasomotor disturbance also increases the irritability of the nerve centers. Therefore, bromids may sometimes be indicated.

We also find, associated with these cases, a dilatation of the stomach or prolapsus of the organ, due to the fact that the women wearing close-fitting and heavy garments about the waist produce these well-known pathologic conditions, such as a pyloric displacement which permits an accumulation within the stomach and sometimes regurgitation from the duodenum and act as an irritant sufficient to produce vomiting.

The third point that I would call attention to associated with congestion of the pelvic viscera and congestion of the mesenteric vessels, is the hypersecretion of the stomach and the involvement of the intestines and colon. The conditions above enumerated, the vasomotor disturbances and the gastro-intestinal disorders, including the colon, are quite sufficient to account for the vomiting that we find in hyperemesis gravidarum. And while I would not object to the term "hysteric," as applied to some of these cases, yet we find these pathologic conditions either existing or coming on during pregnancy, and I would rather ascribe the symptoms to known conditions than attribute the cause to a "neurotic," "neurasthenic" or "hysteric" condition, as these terms throw no light upon the pathology nor give any rational indication for treatment.

In the treatment it is necessary for us to meet the indications, especially the vasomotor disturbances that are found, and this is accomplished by the various methods described in the paper.

I wish to add that hydrotherapeutic measures applied within the stomach are very beneficial in overcoming congestion. It is necessary to use sufficient heat to produce vasomotor stimulation, as in shock, and in many of these cases I have found hot water at 130 degrees F., with the "intra-gastric resuscitator" or a hot water bag introduced into the stomach, of great benefit. This has acted upon the vasomotor disturbance sufficiently to reduce the symptoms of vomiting. Then treatment should be directed to the stomach itself and the intestines. I would emphasize, more than Dr. Bacon has in his paper, the great importance of vasomotor changes that occur in this disease, recognizing them as one of the elements of great importance and which may be found later to be the fundamental pathologic condition found in vomiting of pregnancy.

Dr. GUSTAV FUETTERER—There are three points I would like to touch upon. The Doctor recommends massage for the constipation of pregnant women. Does he recommend this as a rule, and without any fear of producing early uterine contractions? I would like to know how soon after the first hypodermatic injection of saline solution the tetanic attack appeared. I would also like to state that I have used hypodermatic infusions of normal salt solution quite frequently in different conditions and, particularly in one case, I have been able to explain the demonstrated effect to a certain degree by a post-mortem examination. It was a case of dilatation of the bladder with chills and high fever. I made an infusion of two quarts of salt solution. The pulse became of much better quality and the heart's action improved considerably. The fever decreased and the patient improved in the next twenty-four hours very materially. Then the septic symptoms appeared again, and two days thereafter the patient died. A postmortem examination was made, some small miliary abscesses in the kidneys found, and I believe that at the time the salt infusion was made infection of the kidneys and general infection had just commenced. In this case it seemed, to me at least, that the infection had been arrested for at least twenty-four or forty-eight hours and then progressed again. As to the replacing of salts and the benefit of introducing them into the system again, I have had some experience along this line with consumptives. I have used these infusions in quite a number of consumptive patients, with gratifying results. Beneficial results were undoubtedly observable even in extreme cases.

Dr. J. G. KIERNAN—There has been shown a little tendency to criticise Dr. Bacon for his position as to the neuropathic aspect of hyperemesis. Without quibbling about the intermixture of the terms neuropathia, hysteria and neurasthenia, etc., it seems to me, in a strict pathologic sense, not in the sense of gross lesions, neuropathy represents a distinct nosologic condition. If there ever was a condition in which from the standpoint suggested, the subject was illy discussed, so far as hyperemesis is concerned, it is the pregnant condition. It would seem that in popular and general medical opinion a woman must be ill and vomit during pregnancy. There is a psychologic principle underlying suggestion in the treatment of this condition. If the *must* idea was not so much inculcated as it is by popular suggestion in regard to "longings," hyperemesis would be less noted. Furthermore, the therapeutic index is a good one. There is hardly an agent in the materia medica which, when first given by some man of admitted authority, has not produced miraculous effects in pregnancy hyperemesis. As time advances the effects are less. Let any one, for example, read Simpson's use of cerium oxalate of about thirty years ago, and compare his enthusiasm over it with the modified notions there are today, and he will be very much struck with the fact that there is a big difference somewhere between the effects of cerium oxalate then and today, and the most probable explanation of this is along the lines of suggestion. A good many factors of hysteria, pure and simple, enter into hyperemesis. There is many a case, before the complete development of hysteria, in which the patient suffers from hyperemesis. Watson, in his old work on "Practice," mentions fairly typic cases of this kind. In hysteria, in neurasthenia and in neuropathic subjects occurs a condition liable to produce hyperemesis from slight causes of suggestion. Furthermore, it is well known that the mental state of the pregnant woman is peculiarly liable to suggestion.

To discussion of the question whether pregnancy be or be not a physiologic state, a great deal of time might be devoted, but there is not time to discuss that phase of the subject this evening. It does not resemble physiologic states. There are pain and other factors attending it. There are a good many morbid phenomena attending it as well. There is no denying the statement that the hysteric side of the pregnant woman is abnormal. As these women are liable to suggestion, the training should begin early. One person's training would begin with getting rid of the notion that vomiting was a necessary concomitant of the pregnant state.

Dr. Turck spoke of pathologic conditions in these case cases, and his remarks reminded me a good deal of the old pathology of the insane. I can remember the time when physicians used to find lesions in the intestines and elsewhere to account for insanity. Nowadays these are known to be secondary, and not primary conditions. Take the class of women who are given to tying a string around themselves and crowding the viscera down in the pelvis, and abnormal intestinal states that may or may not develop these conditions will result. The fact is that while these abnormal states of displacement among a certain class of women are very common, cases of hyperemesis are rather infrequent.

With regard to the use of saline injections, the fact that under the old theory of their use a number of conditions treated successfully tends to justify their use. There is no doubt that in the conditions of collapse after cholera and allied conditions salines do have an effect.

I agree with Dr. Slayter that in an individual who is water-logged or run down, there exist certain conditions which predispose to infection.

Dr. WILLIAM CUTHBERTSON—I wish to congratulate Dr. Bacon on the excellent paper he has read tonight, and more especially on the treatment of hyperemesis gravidarum by the hypodermatic use of saline injections. I do not think emesis gravidarum is due to any one cause, and more especially am I inclined to that opinion when I read the numerous remedies that have been suggested for the cure of this affection. Giles of London says he has found that primiparæ who have had dysmenorrhea prior to pregnancy, are more especially liable to emesis gravidarum in the early months of pregnancy, and where emesis gravidarum occurs in the later months of pregnancy it is due to hydrops amni, to twin pregnancy, or to the large size of the child. He also cites cases where retroflexion of the uterus has produced emesis gravidarum, which condition has disappeared on the artificial correction of that state. Also, where emesis gravidarum has occurred in retroflexions of the uterus, that it disappeared when pregnancy has lifted the uterus out of the pelvic cavity. I think E. P. Davis mentions a case of hyperemesis gravidarum that terminated fatally, and at the postmortem examination it was found that a cyst of the cervix had in all probability produced the condition. I must take issue with Dr. Bacon, however, when he condemns unqualifiedly the production of artificial abortion in the treatment of this disease. I think that where it is resorted to sufficiently early it no doubt saves a great many patients. About six years ago I had a case of hyperemesis gravidarum occurring in an extremely neurotic patient. She had also a retroflexion of the uterus, the uterus being bound down in the pelvis by adhesions. Shortly after the occurrence of pregnancy, vomiting began, which soon progressed to such a state as to endanger the life of the patient. After consultation, the induction of abortion was decided on and was accomplished by the introduction of a bougie, and almost immediately after the abortion the vomiting was much less, and finally within a week it ceased altogether.

Another case I would like to relate happened in my practice about twelve years ago. The patient was 35 years of age, became nauseated soon after conception occurred, and vomiting progressed to a dangerous state. After putting the patient to bed and using all the means then in vogue for correction of the trouble, the patient went from bad to worse. After a consultation, the induction of abortion was decided on, and was brought about by the use of a bougie. About forty-eight hours after the introduction of the bougie the patient passed a fetus. Pregnancy had then advanced to about the second month. This happened in my practice in the country and I did not get

to the patient until some time after she had passed the fetus, but after the fetus was expelled the vomiting ceased. I thought, in all probability, the placenta had been expelled also, but had been lost sight of. The vomiting ceased for two or three days, and then it began again. I was called and found that she had passed a second fetus, and still no afterbirth. There was no hemorrhage, no elevation of temperature, so I thought the uterus was empty. There was a cessation of vomiting for forty-eight hours when it again recurred. At the end of this time the patient passed a third fetus, and on this occasion the afterbirth came. The vomiting ceased after the third fetus was expelled, and the patient went on to recovery.

I am a great believer in the hypodermatic injection of normal salt solution. In several cases of septic conditions, one case of mine, due to sepsis after emptying the uterus for eclampsia, the hypodermatic injection of normal salt solution reduced the temperature from 104 to about 100 degrees. The patient rallied considerably; there was a more free excretion of urine from the kidneys, but convulsions again set in and the patient died in a state of coma. In a number of cases of surgical shock I have used hypodermatic injections of normal salt solution with beneficial effects in almost every case.

Dr. G. Frank Lydston—I believe Dr. Paddock was correct in stating that in his opinion hyperemesis gravidarum is not consistent with perfect health in a pregnant woman. Dr. Kiernan raised the question as to whether pregnancy was ever a normal condition. Probably not in a civilized woman; rarely at least in the eyes of the obstetric expert. The most salient point that struck me in the discussion was that psychopathy was supposed to be the explanation of the condition in the majority of cases. The element of suggestion, as applied to the cure of such cases is a little far-fetched. In the first place, I believe the report of every serious case of the kind under consideration should be associated with a very careful study of the urine and is incomplete without it. With our modern knowledge of the effects of toxemia dependent upon various toxins, it is not scientific to discuss a subject of this kind without a careful analysis of all possible sources of toxemia, the kidneys constituting the most probable source in cases of this kind. It is the fashion, however, to regard the kidney as being of little importance, providing the urine does not show a solid deposit on boiling, or on the application of nitric acid, or if it is not filled with all kinds of casts and epithelium. Possibly Sir Andrew Clark builded better than he knew, when he spoke of renal inadequacy, a condition in which the kidney may show no organic disease on chemic or microscopic examination of the urine, and yet does its duty so inefficiently that toxemia results. Operations upon the genito-urinary tract sometimes produce fatal results, through disturbances of the nervous system, and may possibly bring about serious results from organic change in the kidney, without any previous evidence of serious renal change. Reflex irritation of uterine origin may do the same thing. It would seem logical to infer that in some cases toxemia resulting from defective bowel elimination bears an important relation to the etiology of hyperemesis gravidarum. It is certainly worthy of thought, and without having made any experiments or observations on this point, I think it would be more logical than the view that these conditions are always of psychopathic origin.

Going back again to the kidney, the effect of irritations of the genito-urinary tract in both male and female, inhibiting the function of the kidney without necessarily the pre-existence of actual renal disease produced reflexly by the irritation, is a point that must be seriously considered. I believe that the principal obstacle to a proper classification has been the almost universal acceptance of the simple view that in all instances the disturbance is due to reflex irritation of uterine origin. The first thing the practitioner does is to look for some source of irritation in the vicinity of the uterus; the next thing he does is to apply something to the cervix, or go through some performance, psychic in its effect, we have heard tonight ostensibly for the purpose of relieving the source of reflex irritation. Cases of hyperemesis gravidarum are too important to attribute to one cause alone. I have no doubt that psychopathy enters largely into the causation in some instances, involving the question of hysteria, but I do not believe it covers them all. A latent neuropathic condition might reasonably be expected to develop and become active as a consequence of pregnancy in certain women. Another class of cases probably would be assigned to renal insufficiency without actual renal disease; another to actual kidney disease. Very likely the renal condition would be regarded by some practitioners as simply a coincidence and its source attributed to reflex uterine irritation instead of the condition being ascribed to its true source, actual renal disease, or toxemia possibly originating in defective bowel elimination. That pelvic disease is responsible for a certain proportion of cases is evidenced by the cases reported by Dr. Cuthbertson and Dr. Paddock, in which reposition of the retroverted uterus relieved the violent and prolonged vomiting. I agree with Dr. Cuthbertson that abortion is to be considered under certain circumstances. I have seen cases in which it seemed to be indicated.

With regard to the treatment recommended by Dr. Bacon for its suggestive effect: taking it for granted that we have toxemia from renal inadequacy or other sources, or admitting that we have toxemia from actual renal disease, is it not possible that the saline injections relieve the irritation of the nervous system by their diuretic and diluent effect rather by modification of the circulation alone? I will grant that much for his method of treatment, but I will grant very little for the cases cited in substantiation of its claims. He cited two cases in evidence, one not his own recovered; the other died of infection and rendered further observation impossible. This patient was infected in two different ways with sepsis and tetanus.

Dr. Bacon (closing the discussion)—In relation to the remarks of Dr. Lydston, I will say that I have given some attention to the renal functions in obstetric diseases, and I believe that the history of the growth of obstetrics is very intimately connected with the growth of our knowledge of kidney diseases. We have had various theories of eclampsia, and there was a time when it seemed only necessary to discover deficient elimination of urea to know positively the cause of eclampsia. When that theory was overthrown we began injecting animals with the urine of eclamptic women, and found eclamptic urine less poisonous than normal urine, and in that way determined that eclampsia is due to the retention in the blood of poisons which should be excreted in the urine. But these experiments have not led to the determination of the cause of eclampsia. I have made some inquiries of one of the physiologic chemists in this city to determine the possibility of making a series of experiments which might be of some real permanent value in determining the rôle played by the xanthin bodies in the pathologic condition of pregnancy. It is already too late to attempt to make the presence of aceton in the urine the key for the explanation of all pathologic conditions of pregnancy, as was done by obstetricians three or four years ago. Now we wish to find out the xanthin bodies. I was assured that it was absolutely impossible at present to obtain any definite information on that subject, and that any observations of the urine made for that purpose are quite worthless. The errors are too great. We talk about determining the elimination of urea by the Doremus test as if that was an exact method, when the slightest consideration will show that our results must be from 10 to 35 per cent. wrong. The time has not arrived to explain the vomiting of pregnancy by examination of urine. Any classification at present has to be based on the facts that are known. The talk about renal disease being the basis of scientific classification of hyperemesis gravidarum is useless. I expressly stated in the paper that I do not believe that hysteria is the only cause of hyperemesis. There are many cases of hyperemesis gravidarum where it is not the cause. But there are many cases where it is an important element as is shown by the curative effects of suggestion. A case described by Chazan is a good example of the value of suggestion in the treatment of these diseases. He was called to a serious case of hyperemesis. The patient had decreased in weight nearly half. She was in a desperate condition. It was thought necessary to perform an abortion, it being quite generally agreed that nothing else could be done, and he succeeded in controlling the patient simply by stating in a positive manner to her that she could control herself by the exercise of her will if she would only do so. She said to him it was quite impossible for her to do it. Then he mentioned to her the grave dangers of abortion, and finally succeeded, by the use of her will, in preventing the vomiting, so that in a week she had perfect control over her disease.

Such a case as this, and there are hundreds of them scattered through the literature, cured suddenly by the use of suggestion and by treatment along that line, shows the importance of the method of this treatment as well as the influence of hysteria in the causation of the disease.

I had expected considerable opposition to my views in regard to the induction of abortion. We do have severe cases which we are not called to see in time, and these are the ones where abortion is to be considered as one of the means that must be employed. The dangers are great indeed. A person in that condition is in great danger of loss of blood and shock. She is in grave danger of infection, and the results given in the literature of the subject do not show that abortion is entitled to consideration, even in the severe cases, and those who advocate it do not recommend it in severe cases.

Dr. LYDSTON—Do you believe these cases are curable if they are seen early?

Dr. BACON—I believe if these cases were seen early there would be no fatal cases, unless there is disease associated with hyperemesis, such as cancer of the pylorus or some disease of that kind.

A word or two in regard to the induction of abortion in the cases cited by Dr. Cuthbertson. If abortion is performed it should not be done by a bougie, but by rapid dilatation and clearing of the uterus, because it is important that the case should terminate as soon as possible, and secondly, by the rapid method there is much less danger of infection. In regard to Dr. Slayter's suggestion as to the danger of infection from hypodermatic injections of normal salt solution I admit that there is danger from injections in dropsical conditions, but these conditions are not present here; on the contrary water is absorbed rapidly by the dry tissues.

In reply to the questions of Dr. Fütterer I will say that tetanus developed five or six days after injection in the first case. It is probable that the tetanus infection was from the injection, although no bacilli were found in the tissues, but of course that does not prove very much. How the infection occurred I can not say. The injection of fluid was not made by myself. In regard to massage I will add that I believe it to be a valuable measure in treating constipation in pregnancy, and not dangerous if carefully employed.

I am quite in accord with Dr. Turck as to the importance of vascular changes in pregnancy, but we do not know enough about the subject to make them the sole basis of a classification. I was very much interested in Dr. Kiernan's additions to the pathologic signification of hysteria.

SELECTIONS.

The Management or Patients Before and After Laparotomy.—Dr. Frederick Holme Wiggin, in a paper read before the Hartford Medical Society and the New York Medico-Surgical Society, January, 1898, considered the management of patients before and after laparotomy as follows: In the early days of the decade now drawing to a close, it was generally believed that abdominal operations could not be safely performed outside of hospitals especially constructed for such work; but it is now known that although personal effort and responsibility are increased, it is perfectly safe to do such operations in ordinary houses. It is, therefore, not improbable that in the near future many of these patients will prefer to be operated on at home, and this means that the general practitioner will have a more important part to play in the management of these cases than has been customary in the past. Where circumstances will permit, one week should be devoted to preparing the patient for the operation. This time can be profitably spent in accustoming the patient to the new environment, in examining the heart and lungs, and the condition of the secretory and excretory organs and in thoroughly evacuating the bowel. Early in the week several small doses of calomel and soda should be given daily, for three days, and followed each morning by a saline. On each of the three succeeding mornings a large enema should be administered, consisting of three or four quarts of saline solution. In order that these large enemata shall be properly given the physician should superintend this part of the work, taking care to see that a fountain syringe is used, that it is not more than three feet above the patient, that the solution has a temperature of 100 degrees F., and that the flow is checked from time to time as the patient complains of colic or of intestinal distention. Six hours before the operation the rectum should be given a final washing out with the same solution. The diet during this week should be light and easily digestible, and the patient should be encouraged to drink freely of liquids and to rest as much as possible. Every day, a hot bath (110 degrees F.) should be given for ten minutes, and in the daily ablutions special attention should be paid to the navel and pubic region. The nervous system may be quieted by administering, on alternate nights, a mild hypnotic, such as a combination of sulfonal and chloralamid, and arranging its administration so that a dose is given on the last night before the operation. The skin of the abdomen is prepared for the surgeon by applying a soap poultice over the proposed site of the incision for two hours, and then substituting a compress moistened with weak bichlorid solution. If the patient is a woman, the time selected for the operation should, if possible, be a few days after the cessation of the menstrual flow, and the vagina should be thoroughly douched, first with a solution of boric acid, and afterward, with a 0.5 per cent. formalin solution, or a 1 to 4000 solution of bichlorid. It is better to operate in the early morning than in the afternoon. If the former has been selected, the patient should be given a peptonized milk punch at eleven o'clock the previous evening. The administration of an ounce of liquid peptonoids about two hours before taking the anesthetic stimulates the heart and diminishes the subsequent nausea and vomiting. If the operation is to be done in the afternoon, the peptonized milk punch may be given in the early morning, and the peptonoids at 11 A. M. The patient's body and limbs should be properly protected with clothing during the operation. The furniture of the room should be removed and the windows left open for two or three hours. Then, the woodwork should be wiped off with bichlorid solution, 1 to 1000, and the floor liberally sprinkled with the same solution. The operating table should be about 20 inches wide and thirty high. The following articles should be provided, and, after cleansing and washing with bichlorid solution, should be placed in the room: Several small tables or stands, a few wooden-bottomed chairs, several pitchers and meat platters, four or five basins and a fish-kettle for the instruments. In addition, there should be several gallons of both hot and cold water, sterilized by boiling, and at least a dozen towels sterilized by steaming. For emergency cases it is safer to cover the floor with a sheet wet with bichlorid solution than to stir up the dust of the room by more elaborate preparations.

The anesthetic should be administered before bringing the patient into the operating-room, and if ether is to be employed, it is better to give, subcutaneously, half an hour before, ⅛ grain morphia and 1/100 grain of atropia. A closed ether inhaler allows of the easy and rapid induction of anesthesia and the maintenance of this state with a minimum of the anesthetic. The skin is finally prepared for the operation by a scrubbing with hot water and tincture of green soap, followed by irrigation with sterilized water, ether and alcohol. If the patient be a woman, it should be made an invariable rule to irrigate the vagina and swab it out with gauze. The author strongly favors making the incision through the right or left rectus muscle, instead of through the linea alba. He also believes that leaving a considerable quantity of hot saline solution in the general peritoneal cavity, after irrigation, acts as a stimulant and at same time tends to prevent the formation of intestinal adhesions. In closing the abdominal wound the deep sutures should be placed at least one inch apart, and loosely tied. The edges of the skin may be accurately adjusted by a buried suture of silkworm gut. If, during the operation, the pulse increases twenty or thirty beats, a subcutaneous injection of 1/12 grain of strychnia and 1/100 grain of nitroglycerin should be administered, and repeated as required. If in spite of this treatment the pulse exceeds 150, one or two pints of warm saline solution should be at once introduced into the median cephalic vein. The patient should be put to bed with warm blankets and bottles, and soon after consciousness has been restored, should receive *one* dose of 1/100 grain of atropia and ⅛ grain of morphia. It is not necessary to keep the patient in one position for the first few days. For the first twelve or eighteen hours nothing should be given by mouth but small quantities of warm water. If there is much gastric irritation, it may be relieved by the external application of chloroform to the epigastrium. After this period, a drachm of liquid peptonoids may be given

every twenty minutes for four doses, and then small quantities of peptonized milk may be cautiously added, gradually increasing the quantity, and lengthening the interval. Once in twenty-four hours an interval of six hours should be allowed in order to rest the stomach. If there is much intestinal distention, this can be relieved by the introduction of a rectal tube or the nozzle of a syringe, or by massage along the course of the colon. Usually no cathartic need be administered until the third or fourth day, and then small doses of calomel and soda should be given, followed by two or more Seidlitz powders. If, as is usually the case, the temperature is normal by the evening of the fourth day, the patient may be allowed to rapidly resume ordinary diet. The dressings should be changed on the fifth day, and if the sutures are cutting through, they should be removed and the wound supported with strips of adhesive plaster. The complications which may be met with occur in the following order: Concealed hemorrhage, peritonitis, intestinal paresis, intestinal obstruction and stitch abscesses. As soon as concealed hemorrhage is diagnosticated, an intra-venous saline injection should be administered, but it is useless to operate unless the patient shows a reasonable response to stimulants. The onset of peritonitis is usually announced by a steady increase in the frequency of the pulse, and this should be the signal for the prompt evacuation of the bowel by calomel and salines, and by enemata of glycerin and water, or of a saturated solution of sulphate of magnesia. When there is intestinal paresis the stomach should be washed out and salines freely administered. As soon as intestinal obstruction is recognized, the abdomen should be re-opened and the constriction relieved. Stitch abscesses usually announce themselves by the fourth or fifth day. In estimating the patient's condition, the facial expression is of the greatest value.

Keratosis Follicularis (White); "Porcupine Disease."—Dr. J. C. White in the *Boston Medical and Surgical Journal*, November 11, has given a clinical demonstration of this new affection. Both Darier of Paris and Dr. White in 1889 recorded a case, the former naming his as being a *psorospermose folliculaire végétante*. Dr. White used the term keratosis follicularis. The disease appears to be a simple hyperkeratosis, a modification of the process of cornification consisting in heaping up of modified cells in the mouths of the follicles. The clinical appearances were very various, consisting in the beginning of small horny papules, closely resembling the keratosis of lichen pilaris of the arm. From these the process extended into larger semiglobular elevations, hard and becoming somewhat discolored. These were all seated at the mouths of the follicles. By confluence there grew large horny concretions here and there, one-third to one-half inch in height and of about the same diameter. The disease at its highest point of development consisted of conical projecting horns resembling miniature cutaneous horns. In that case the whole surface of the body was largely covered and in certain parts the process was enormously developed. "The case in Paris, which I subsequently saw at the International Congress, had not advanced to this degree, but Darier and other French observers asserted that it was a case of psorospermosis and that the peculiar cells found in the tissues were psorosperms, or coccidiæ, and the name psorospermosis has remained from that time to this. Since then other cases have been observed, but only a very few, in other parts of the world. I do not doubt it was in existence a long time before and it is my opinion that so-called 'porcupine men' (ichthyosis hystrix) were cases of this disease. When I returned from Paris the first patient I saw on entering the clinic was this patient and she presented the same affection. By one who had seen the disease it was immediately recognized by this peculiar appearance of the face. The disease has not advanced very greatly since that time. The whole forehead is occupied by a mass of horny papular growths. Behind her ear the process is much more fully developed. On other parts in the pubic region this process is still more highly developed. There is a little on the wrists. It extends down on the chest in front and in the rear about the same distance. There is a little scattered eruption on the arms and legs. The very peculiar bodies which are found in every one of these papules, large round cells, are not, it has now come to be believed, animal parasites, but are peculiarly modified epithelial cells. It is not a coccidial disease and even Darier has given up that opinion. Although the French name remains, keratosis follicularis is the proper name, because it is a descriptive title and not misleading. We have a case here which is of medium grade, and my first case was this young woman's father. That does not indicate that it is a contagious disease, because this girl was less than a year old when separated from her father and never saw him afterward, nor does it show necessarily a hereditary tendency to this affection, because it is only in one or two other instances that it has affected more than one member of a family."

PRACTICAL NOTES.

Treatment of Gastro-intestinal Catarrh.—Liebreich recommends for the cases in which the diarrhea can not be treated with opiates: Tincture of calumba and tincture of cascarilla, each 10 grams. Twenty drops four or five times a day.—*Semaine Méd.*, January 12.

Tetanus and Trismus Treated with Behring's Serum.—Two more cases successfully treated with Behring's serum are reported in the *Münch. Med. Woch.*, No. 46, 1897. Mortality in tetanus usually varies between 50 and 80 per cent. The mortality in the cases treated with Behring's serum, as recorded to date in literature, is 41.8 per cent., which should encourage its further use.

Test for Aceton in the Urine.—Mallat first distils the urine to a quarter of its original volume, and then applies the principle that a solution of iodin will precipitate iodoform in contact with an alkaline solution of aceton. The amount of aceton is determined by the amount of iodoform precipitated.—*Nouv. Remèdes*, January 8.

Alumnol-Iodin Treatment of Metrorrhagia.—Grammatikati's method of treating catarrhal endometritis with intra-uterine injections of equal parts of tincture of iodin and a 5 per cent. alcoholic solution of alumnol, has been applied by Orlov, with great success, to the obstinate metrorrhagia of the critical period. He reports three cases remarkably improved by two or three injections, and practically cured by ten or twelve.—*Semaine Méd.*, January 12.

Air-Tight Drainage.—Ikawitz supplements the ordinary Kocher fenestrated drain tube with another closed tube, with a projecting rim at the junction. The rim fits in with a suture; the drained fluids are collected in the bottle tube; the dressings kept dry, and if the subcutaneous tissue alone is to be drained, the bottle tube with its rim is sufficient without the Kocher part.—*Cbl. f. Chir.*, Dec. 31, 1897.

The Hemostatic Action of Hyposulphite of Lime is announced by Silvestri, who has arrested with it hemorrhage of all kinds, from that accompanying round ulcers to postpartum and endometritic hemorrhage. He administers an average of eight grams a day divided into six powders, and attributes its action to increased coagulability of the blood.—*Semaine Méd.*, January 12.

Treatment of Psoriasis with Arsenious Acid.—Herxheimer confirms his previous announcement in regard to the efficacy of this treatment. He reports ten completely cured; six so improved that they were satisfied with a partial cure, and seven still under treatment. He commences with 0.001 acid. arsen-

icosum, and increases by the same amount each day until the dose reaches 15 mg. which he continues until complete cure, usually requiring forty-eight days. He states that secondary effects were slight, and that if the affection should recur, he believes that a partial course of treatment would promptly abort it.—*Cbl. f. Chir.*, Dec. 31, 1897.

Auscultation of the Mouth.—Professor Galvagni calls attention to the valuable information to be derived by auscultation of the mouth in regard to incipient tuberculosis, etc. The râles are reflected from the bucco pharyngeal cavity as from a sounding-board. He also notes a peculiar jerky glottic sound, not in the inspiration, but commencing in the pause, attaining its height about the middle of expiration, diminishing and vanishing completely at the commencement of the inspiration. It coincides with the rhythm of the pulse, and has been noticed in several tuberculous patients, and in one case of gastralgia of uterine origin—*Gazzetta degli Osp. e delle Clin.*, December 5.

Iodoform Injections in Tuberculous Lymph Glands.—Hammerschlag has been remarkably successful with intraglandular injections even in the large celled hyperplastic lymph glands on tuberculous subjects, which usually are sent to the surgeon. In the case of well-to do patients he precedes the injections with the general anti-tubercular treatment, climate, baths, etc. After local anesthesia he injects one to two centimeters of the 5 to 10 per cent. iodoform-glycerin emulsion, first on one side and a week later on the other. He states that the result in his six cases was remarkably rapid and satisfactory, the tumors subsiding until not a trace could be seen above the skin and no scars left. In another case he found the results equally fine although the injections were made in the periphery of the gland, and he suggests that others with larger material at their command might experiment whether periglandular injections may not be as efficacious as the intraglandular.—*Deutsche Med. Woch.*, December 23.

Prophylaxis of Nephritis in Scarlet Fever.—Professor Alfaro of Buenos Ayres prevents altogether this dangerous complication of scarlet fever by observing the following precautions: 1. Keep the diuresis abundant with a strict milk diet, plenty of drinks, and cold hydrotherapy in severe cases. 2. Avoid the elimination by the kidneys of any irritating substances either from medication or from the food (avoiding phenol, salicylic acid, antipyrin, acetanilid, etc.). 3. Keep the functions of the skin as active as possible by general friction with fatty substances and tepid bath during desquamation. 4. Keep the mouth, nose and pharynx aseptic with frequent mild antiseptic applications to prevent the introduction of the streptococcus into the general circulation. 5. Avoid sudden or continued exposure to cold air. 6. Use no antipyretics or antiseptics that could possibly affect the kidneys injuriously by elimination or absorption.—*Anales del Circ. méd. Argentino*, October 15.

Tuberculosis of the Ganglia of the Neck.—Cervical scrofulous adenitis is no longer considered a morbid entity, but merely that the scrofulous predisposition induces cellular hyperplasia in ordinary infections more readily. This hyperplasia persists and forms a favorable soil for the development of tuberculosis, which may remain localized a long while. The infection occurs almost always by way of the lymphatics, with caries of the teeth, the tonsils, adenoid vegetations, etc., for the entering point. Tuberculous adenitis develops almost inevitably into the fistulous form; absorption or calcification are extremely rare. There is a form of adenitis which presents the characteristics of tuberculosis, but proves to be non-bacillary. In the suppurated form there may be secondary infection, but pus collections are frequently observed, especially in the adult, which develop rapidly and yet only contain the Koch bacillus. This form of tuberculosis very rarely extends toward the mediastinum; owing to the arrangement of the lymphatics the tendency is toward the axilla. The best treatment is thorough extirpation, a simple operation in non-suppurated cases. Interstitial injections should be reserved for the cases in which an operation is rejected, or counterindicated by the general condition.—R. Petit, *Gaz. Méd. de Liège*, December 23.

Tincture of Myrrh in Diphtheria.—Dr. Ströll, writing in the *Allgemeine Medicinische Central-Zeitung*, very strongly recommends tincture of myrrh in diphtheria. The mixture he uses is composed of tincture of myrrh 4 parts, glycerin 8 parts, and distilled water to 200 parts. This is given very frequently, every hour or even every half hour in the daytime and every two hours at night, infants up to the age of two taking a large teaspoonful (75 minims), older children double that quantity and adults three times as much. This is continued until the membrane has nearly disappeared, when the doses are only given every two hours. After all the membrane has gone the treatment is continued for a couple of days, the interval between the doses being increased to three hours. This is with the view of preventing any recurrence. Usually the fever and lassitude disappear in twenty four hours, so that a child may frequently be found within that time sitting up in bed playing. He says that there does not seem to be any need for local treatment; in the case of older children and adults a gargle containing 0.5 per cent. of resorcin may be employed every hour or oftener in the daytime, and where it is desired the tonsils may be painted every hour with the tincture of myrrh undiluted. Where the larynx is involved Dr. Ströll prescribes the myrrh and glycerin mixture, in an inhaler or spray to be used every half hour. By the employment of this method Dr. Ströll states that he has only lost one case out of eighty and he has collected reports from several other practitioners in various parts of the world who have treated altogether 182 cases with 22 deaths. No mention, however, is made in his own or in the other cases of bacteriologic verification of the diagnoses. The *rationale* of the efficacy of myrrh is supposed by Dr. Ströll to be that this drug increases the phagocytic elements in the tonsils.

Protargol, a New Disinfectant.—The prolific factory of the Bayers at Elberfeld presents a new candidate for disinfectant honors, a compound of silver and protein. This substance was discovered by Dr. Eichengrün, the chemist to the above factory, and is termed "protargol." Dr. Benario of Frankfort has now examined its action and publishes his results in the *Deutsche Medicinische Wochenschrift*. He states that it is an energetic bactericide, a 1 per cent. solution destroying the bacteria of anthrax and enteric fever, as well as pneumococcus, bacterium coli, staphylococcus pyogenes aureus, etc. In experiments made with rats it was found that injections of 2 c.c., of a 1 per cent. solution caused necrosis at the place of the injection, but were not fatal to the animal. An injection of 1 c.c. of a 10 per cent. solution produced an infiltration and total necrosis of the skin, the animal dying in a fortnight. A 20 per cent. solution dropped on the conjunctiva of rabbits produced an increased secretion of the lacrymal glands; an application of pure protargol caused abundant swelling of the eye and the surrounding tissue. But within five days the normal state reappeared, the cornea being clear as before. Injection of a 1 per cent. solution into the urethra caused a slight smarting. The purulent secretion nearly disappeared within a week, and in a fortnight gonococci were no longer discoverable. Professor Neisser of Breslau, who also tried the remedy, stated that he had never before had so good, sure and prompt results in gonorrhea. In surgical practice it was used for the dressing of wounds in about 150 cases. In phlegmonous inflammation, dressings moistened with a 5 per cent. solution were applied; in recent wounds the substance was used in the form of powder. In various ulcerations it was employed as an ointment, while in tonsillitis a 5 per cent. solution applied to the inflamed tonsils proved useful.

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SATURDAY, FEBRUARY 12, 1898.

THE TYPHOID FEVER DEATH RATE.

The death rate from typhoid fever in this country during the census year 1890, was 46.27 per 100,000 persons, but as this is recognized as under-stating the facts from the necessarily imperfect character of the returns, a better idea of the prevalence of this fever may be obtained from the death rate, 53.25 of certain urban populations in which the records were considered to be accurate. The death rate from typhoid fever in England was in that year only 17.9 per 100,000, and that this was not an exceptional year is shown by the last published report of the Registrar-General, which shows only 17.5. Moreover in every 100,000 of our population we recorded about 20 deaths from malarial fevers, a considerable proportion of which was certainly due to the infection of typhoid fever, while the English have no analogous additions to their recorded typhoid rate. These statistics are startling when we consider that far from being an unknown and mysterious epidemic influence, the cause of this fever has been recognized and many of its modes of propagation have been discovered. Thousands die annually of typhoid fever in the United States without disturbing the general equanimity, because the disease is indigenous and the people are accustomed to its ravages; but were an exotic disease causing a similar death rate to be introduced, no effort would be considered too great to effect its suppression. Money would be spent freely to stamp out the pestilence; but money spent freely in giving the people of every city, town and village a pure water for domestic use, would free the country in a great measure from this indigenous scourge. In 1872 Massachusetts led the way in an effort to preserve the purity of her rivers and public water supplies. Other States, as Illinois, Minnesota, New York and New Hampshire followed in her lead, but sanitary progress is slow. For several sessions a bill has been before Congress to prevent the contamination of rivers and other natural water sources in which the citizens of more than one State are interested, but no action has been taken.

Now, however, that attention has been directed to the condition of the Potomac supply of Washington, D. C., it is to be hoped that something may be done. On January 10 last, the Secretary of War was requested to furnish the United States Senate any information in the possession of the War Department in relation to the filtration of this water-supply, together with any suggestions on the subject by the Surgeon-General of the army and the officer in charge of the Washington aqueduct. Surgeon-General STERNBERG reports that as compared with other cities in this country and abroad, the sanitary condition of Washington as judged by the typhoid fever mortality is far from being creditable, and that the relatively low death rate of 53 per 100,000 of the past year (the annual average of the past twenty-two years having been 64) was probably due to the replacement of a number of box privies by running closets, improved drainage of premises and a closer supervision of the milk-supply. As to the Potomac water he states that sanitarians in all parts of the world look upon the typhoid fever mortality of a city as the best index of its sanitary condition. It has been repeatedly demonstrated that the introduction of a pure water-supply or the filtration of a sewage polluted water, together with the introduction of a well devised system of sewers, has a notable effect in diminishing the mortality from this disease. Observations made by bacteriologists in Washington show in the Potomac water the almost constant presence of bacteria, indicating contamination by fecal matters of man or the lower animals. Fecal contamination of a stream, the water of which is used for drinking purposes, is always an indication of possible danger. General STERNBERG considers the construction of filter beds to be the most reliable and practical method of improving the quality of the Potomac supply, but suggests that before entering on an undertaking of such importance and cost, it would be judicious for Congress to appoint a commission to investigate the subject, with authority to visit Europe for the purpose of witnessing the practical workings of filtering basins now in use, and to estimate the cost of a basin suitable for the purification of the Washington supply.

An investigation of this character under Congressional auspices would have an influence which would extend beyond the banks of the Potomac to other streams and sources of supply. It would arouse local authorities to an understanding of the conditions

under which typhoid fever prevails, and would suggest the urgency of procuring that which every community should have, a plentiful supply of pure water.

All this shows the need for a Department of Health to act on behalf of the Government in this and other matters pertaining to the public health in the territories and the District of Columbia; to advise the health authorities of the various States and co-ordinate their efforts to reduce the mortality from preventable diseases.

NEW FACTS IN REGARD TO VITALITY.

It is not very long since the current physiologic theories of vitality practically assumed that we knew all about it, or if we did not we soon should, as it was only a special manifestation of physical and chemical laws. Our knowledge of the subject has not contracted any since then, but we have learned facts that cause us to better appreciate its limits, to be a little less presumptuous in our ignorance, and to recognize that in the phenomena of life we have evidence of an agency not correlated with the ordinary forces of nature and not controlled by but controlling or guiding the ordinary recognized laws of matter.

A recently published paper (*Nature*, December 9) by HORACE T. BROWN and F. ESCOMBE, recapitulates a number of facts already made known, but neglected, and adds some striking ones that are new and due to the investigations of these authors. It is well known that seeds retain their vitality and germinative power for long, and according to popular belief almost indefinite, periods. The condition of the protoplasm in seeds in their inert state has been to some extent a matter of dispute, and while some authorities have held to a theory of continued but minimal vital activity, a sort of intramolecular respiration, others have maintained that metabolism is completely suppressed, and that there is for the time an absolute loss of all the power of internal adjustment to internal relations, which according to HERBERT SPENCER is the essential characteristic of living substances. To test this ROMANES made a series of experiments which were in their way remarkable; he subjected seeds to a number of tests, placing them in high vacua, of only one-millionth of an atmosphere for periods of fifteen hours. Others still were subjected to the actions of various gases, oxygen, hydrogen, nitrogen, carbon monoxid, carbon dioxid, hydrogen sulphid, aqueous vapor and the vapors of ether and chloroform. Neither the high vacua nor the subsequent exposures for long periods to the above-named gases had much if any effect upon the germinative power of the seeds, though in some of the above conditions ordinary respiration by gas exchange must have been practically abolished. There remained however a possibility of some chemical interaction; it is therefore impossible to say that all metabolic activity was altogether suspended. These experiments though interesting and suggestive are not quite conclusive.

In 1881 WARTMANN subjected seeds to a temperature of —110 Centigrade (—166 F.) without effect on their vitality, and three years later DECANDOLLE and PICTET reported similar experiments, using temperatures of —78 to —120 C. In 1893 PICTET claimed to have exposed seeds to nearly —200 C. without effect, and concluded that, as all chemical action is annihilated at —100 C. (—148 F.) vitality must be a special law of nature, like gravitation, and not under the other known laws.

These prior investigations rather detract from the originality of Messrs. BROWN and ESCOMBE'S experiments, but they are not offered as the first of the kind, and are so detailed and complete as to be of especial value and interest. By the slow evaporation of liquified air they succeeded in submitting a number of seeds of common plants, including among them representatives of the Leguminosæ, the Liliaceæ, the Gramineaceæ, etc., air-dried and thus still containing 10 or 12 per cent. of moisture, to a temperature of 183 to 192 C. below zero (—297 to —313 F.) for one hundred and ten consecutive hours. Then they were carefully thawed, the process lasting about fifty hours, and their germinative power was found to be unimpaired; there was no appreciable difference in this respect between the seeds thus treated and the others used in the control experiments.

This result is the more striking since these were all highly organized species of plants, while some of the lower organizations succumb to less extreme temperatures. In 1892, for example, DEWAR and MCKENDRICK found that a temperature of —110 C. for one hour sterilized putrescent substances. This would indicate that certain saprophytic bacteria in their active state were unable to endure low temperatures. What their potential vitality might be in a germinal or non-active condition is perhaps another matter. DECANDOLLE, from his experiments, concluded that protoplasm must be, while still vital, inert in these low temperatures and compared the condition to that of an explosive mixture which is a storage mass of energy though quiescent. BROWN and ESCOMBE also come to the conclusion that there is no conceivable possibility of any metabolic activity existing in the seeds under the conditions in which they placed them, and that we will therefore have to modify our conclusions and definitions of life or vitality. HERBERT SPENCER'S definition already alluded to, which has been perhaps as much a favorite as any—that it is a continuous adjustment of external to internal relations—must be given up as insufficient; it is a definition of vital activity rather than one of life itself. We may have to fall back on BICHAT'S circular definition, that life is the sum of the influences, whatever they may be, that resist death, as

an expression of our ignorance of the real nature of vitality.

There is still another point raised by the English experimenters. In 1871, Sir WILLIAM THOMSON (now better known as Lord KELVIN) made the suggestion that the origin of life on our planet might be due to germs transported from other worlds by meteoric bodies. This was hardly considered seriously at the time, the conditions in space being considered such as to preclude its probability. These recent experiments show that it can not be the temperature of interstellar space that makes the hypothesis an improbable one and give a sort of plausibility to the suggestion. There are of course other factors to be considered, but these recent developments add a new interest to speculation, while they deepen rather than clear up the mystery of life.

PROTECTION FOR THE RED CROSS.

Senate Bill 1913, "To protect the insignia and the name of the Red Cross" passed the Senate Jan. 6, 1898 and was referred to the Committee on the Judiciary by the House of Representatives on the following day. This seems at first sight like a praiseworthy bill entitled to the support of every humane and patriotic legislator, but when we come to scan it and the arguments in its behalf we find that there are in existence two RED CROSSES, one of which is official and has asked for no protection, while the other in petitioning for protection speaks as if speaking for both and as if authorized to do so. The first is the Red Cross, the hospital flag and the badge of hospital corps neutrality of all the nations that have accepted the articles of the Geneva treaty of 1864. The 7th article of this treaty provides that hospitals and ambulances shall carry in addition to the flag of their nation a distinctive and uniform flag having a red cross on a white ground; and that their staff shall wear an arm badge of the same colors, the delivery of the brassard for the arm to be made by the military authorities. The 8th article provides that the details concerned in carrying the other articles into effect shall be left to the Commanders of armies. This is the only Red Cross which our Government recognized in accepting the treaty of Geneva, as it is the only Red Cross mentioned in the articles.

The sympathies and energies of those who were instrumental in bringing about this treaty led them to suggest the formation in each country of an association to gather supplies for the wounded and even to take the field in aid of the Army Medical Department in case of need, these national associations to be united into an International Association for systematic co-operation in great wars. Accordingly this International Association was formed, and it *assumed* the Red Cross of the treaty as its flag and insignia, although no article of the treaty authorized the assumption, but on the contrary articles 7 and 8 indicate the military authority or War Office as the only power competent to authorize the wearing of the Red Cross neutrality brassard or the hoisting of the official hospital flag. Nevertheless the United States branch of this International Association, incorporated under the laws of the District of Columbia as the American National Red Cross asks Congress to make it unlawful for any person or association of persons to wear or display the sign of the Red Cross without permission from the American National Red Cross, for the purpose of collecting, soliciting or receiving money or material or who shall by the use of said symbol or name of the American National Red Cross do or attempt to do similar work to that of the American National Red Cross, without permission from that organization.

We have four prominent objections to the passage of this bill. 1. As a general principle no restraint should be imposed on the charity or humanity of individuals, states or nations. 2. The bill fails to distinguish between the Red Cross of the treaty and the same cross assumed as the insignia of a local organization. Indeed from the ingenious manner in which both are mixed up in the preamble of the bill, it would require a reference to the highest court to determine whether on its passage the U. S. Army and State troops could continue to wear their badge of neutralization, unless with permission of the American National Red Cross. Moreover as there is officially only one Red Cross, that of the Geneva treaty, can Congress overlook the provisions of the treaty and authorize an Association to distribute its specific and sacred badge at its pleasure? 3. The bill fails to protect the Red Cross as there is nothing in it to prevent anyone from placing Red Cross brands of tobacco or whisky, etc., on the market. 4. The scope of the bill is more extensive than its title. It is a bill to extend and exemplify the powers of an association, incorporated under the laws of the District of Columbia, by recognizing it as a federal institution, the only one through which voluntary aid could reach the sick or wounded of the Army, because the only one by whom or through whom could be worn a red cross indistinguishable in form, color, size and position from the Red Cross of the Geneva treaty. If the citizens of Massachusetts, Louisiana, Illinois, or any other State desired in time of war to come to the aid of the Medical Department of the Army by collecting and forwarding supplies, or by outfitting a volunteer corps for field or hospital service, they could under existing conditions obtain safety for their supplies and neutrality for their personnel from the military authority competent to grant the use of the Red Cross under the articles of the Geneva treaty, but under the terms of this bill they could do nothing without first

touching their cap to the then chief of the American National Red Cross.

If any bill to protect the Red Cross is passed by the Congress of the United States, it should be one to protect the Red Cross of the Geneva treaty and to prevent its use in any way except under the terms of articles 7 and 8 of the said treaty. Miss CLARA BARTON, the President of the American National Red Cross, stands high in the esteem of the U. S. Military Surgeons for her efforts to secure the formal acceptance of the Geneva treaty by the U. S. Government, and in times of calamity her name becomes a household word throughout the country. The aid given under her superintendence at various times, as during the forest fires in Michigan in 1881, the earthquake in South Carolina in 1886, the Johnstown inundation of 1889 and the tidal wave of 1893 shows that the work of the American National Red Cross can be efficiently performed without such legislation as will compell all aid and assistance contributed by U. S. citizens to be registered under its stamp and seal.

THE HUNT MEMORIAL.

The dedication of the Hunt Memorial Society Hall at Hartford, Conn., was the occasion of more than local interest. Dr. HUNT had been a leading physician for nearly half a century, and his family, to commemorate his name, offered the local medical society a building for a library, museum, laboratory and lecture room. The society purchased the ground and a thirty thousand dollar building has been erected for this purpose. The dedication was marked by a notable address from President GILLMAN of Johns Hopkins University of Baltimore. The building is especially adapted for social and scientific work. Large cosy parlors and sitting rooms, with a kitchen and dining room, after the fashion of a modern club are provided. Other rooms are fitted for laboratory and chemic research and the foundation of a large library has already begun. Rooms for research, writing and consultation of books and periodicals are large and well arranged. One large lecture hall and several smaller rooms for society meetings are provided, and altogether this building is most admirably adapted as a home and resort for men. One of the peculiarities which sounds strangely is the provision for a free dispensary. A set of rooms has been fixed up for the work of a dispensary under the care and control of the society. In a city of seventy thousand inhabitants with two hospitals and two dispensaries, to open another for free charity, or to combine those in operation, seems out of harmony with the sentiment of the best medical experience of the present. Fortunately the dispensary is only a project and not yet organized, and probably will never come into practical existence. Outside of great medical centers this is the first building for this special purpose which has been erected. In almost any town of any size, secret and other societies, with clubs of every description, have houses and special buildings as permanent homes, while medical societies are practically houseless. There are probably not more than a dozen buildings owned and occupied by medical societies in the country. Physicians often urge the endowment of hospitals and dispensaries, when they should ask for a society home, which would be a greater charity.

One of the great wants of the day is a closer union of medical men in their work and practical every-day life. In large towns and cities a medical club house with library, laboratory and social rooms are indispensable for this purpose. The Hunt Memorial Hall in Hartford is a model of what should be erected in every large town and city of the land. It is understood that further endowments will be made to this memorial building so that the expense of sustaining this house will be nominal to all its members. The time has evidently come for a change in the organization of free dispensaries and hospitals, and the rush of physicians to give free services, both pauperizing themselves and their patrons. If the same energy displayed in this direction was turned to provide society homes and libraries, an immense advance would be noticeable in the practice of medicine. Every society of thirty or forty members should have a medical club house, with every facility for scientific and social recreation. Young men of limited means could find here libraries and opportunities for study invaluable to them. The great number of periodicals could be gathered and kept on file and books from all sources would accumulate, and valuable libraries now lost could be kept together on the death of the owner. The periodicals and books together with everything pertaining to medical progress would accumulate here, making it a center of increasing interest to all medical men. Not the least of these privileges would be the social part, and the lecture room. If men of other vocations can build expensive club and society houses, and receive permanent good from such associations, why should physicians not do the same? It would seem that medical society homes were indispensable for all practitioners, even more so than homes for men in trade or other professions. The example of the Hartford society in their Hunt memorial home, should be followed by every medical society in towns and cities where the profession can gather without much loss of time and effort.

NOTIFICATION OF CONTAGIOUS DISEASES.

"It shall be the duty of every physician called to attend a person sick or suspected to be sick with cholera, yellow fever, smallpox, diphtheria, scarlet fever, measles, whooping cough, typhoid fever, typhus

fever and tuberculosis of respiratory organs, within twelve hours thereafter to report the name and residence of such person to the board of health or its proper officer within whose jurisdiction such person is found." etc.

Such is the substance of a resolution recently passed by the Department of Health of Cincinnati, and it is the expressed intention of the efficient health officer that the resolution shall be carried out as far as possible. This move on the part of the department is no doubt a beneficial one to the general public, but we should stop for a moment and consider what part the doctor in attendance is to play in this extended line of prophylaxis. He must fill out the printed postal cards and send them to the department, or otherwise notify it, under penalty of a fine or imprisonment for failing so to do, and the remuneration he receives is his inward satisfaction and relief in having complied with the rules laid down by the political heads of the municipal government. He receives no compensation whatever and whose fault is it but his own? Does anyone ever see a lawyer doing any of this charity work for the good of the general public? Was a politician ever known to fill any office in a health department and gather these reports and not be paid for doing so? Is not the doctor, if fortunate enough to have property, taxed the same as other people, does he not have to pay rent and in several cities register or procure a license to practice, which in no instance is made a present to him by the State or city, and has it not been decided by some courts that man (even a physician) is entitled to compensation for the work he does or the services he renders, and hence why should he not be compensated for his share of the enforcement of this regulation? This may be regarded by some as a too mercenary or business-like view of the practice of medicine, but in these times when the clientelage of the physician almost invariably pay everyone else before they pay him, when the courts in many instances deny the physician his just dues, when the public expects the doctor to contribute the best years of his life (made short by the many hardships and exposures he is compelled to endure) to the care and treatment of many cases of charity who are unable to compensate him in any degree, or to the army of deadbeats who resort to every means to avoid paying their bills, it is time that the doctor took a little more business-like view of his calling. He should value the years he has spent in the most laborious efforts to perfect himself in his art, the thousands of dollars he has expended in education, library, instruments, etc., and then profit by the examples of thousands of practitioners who have lived long and noble lives in caring for the sick, and at the close of their life of hardship, exposure, anxiety, study and privation, have been unable to save enough to leave their widow or family in circumstances little short of penury.

There can be no valid reason why a moderate fee should not be allowed for such reports when made by a physician. The rich and affluent need not demand or receive it, if they do not so choose, but there are physicians to whom even this stipend would be welcome and it certainly is only just that the worker should receive his wage.

CORRESPONDENCE.

Appendicitis; Rejoinder to Dr. Carstens.

RICHMOND, IND., Jan. 23, 1898.

To the Editor:—If Dr. Carstens will read carefully, he will see that I am not opposing operative methods, as I said in two of these cases I had been called to operate and found one case dying, and a second so much improved that I declined to operate; and in two other cases, not included in the eight reported, they refused operation, and a third not included recovered. Hence it is unfair to represent me as being opposed to operation (I am not). But in a careful study of the disease and from reports of surgeons I am still of opinion that many cases under judicious treatment would recover and avoid the knife. I have, as I reported, made postmortem examinations whenever possible, to study the nature and progress of the disease, and am not wholly a novice in operation. . . . My experience teaches me to conserve human life on both lines, viz., by operation and no operation. Hence it is a question of enlightened judgment and not by the *ipse dixit* of him who may be lacking in the careful study of cases. He says: "The article refutes itself." Now, if the Doctor had read carefully . . that I was called to operate in two of the cases, he would not have said I was opposing operation and advising more conservative treatment. I do not claim that some of these cases were judiciously treated, or treated at all for this trouble, and that is a reason why they died. It does not change the facts in the case. The statement was made that "the ambitious who are inexperienced" operate when a patient is *convalescing* (which was not true in any of these cases), "but the experienced surgeon will postpone an operation and urge an operation in the interval." Then he goes on to say: "However, all experienced surgeons urge immediate operation upon every case, claiming that the mortality will not be more than 2 to 5 per cent." I answer: They do not, and Dr. Carstens is not authorized to represent the surgical profession so dogmatically, as I can show to be so from records coming from attainable sources and by accomplished surgeons who have been in the field perhaps longer than my reviewer. . . . As to recurrent attacks, it is not true in the cases recovered in this list so far; no case has had a recurrent attack and I am as well advised as to this fact as is Dr. Carstens, but I answer, that it is not true that recurrence occurs as often as appears in the statement; and especially when we remember that the troubles which occur in this region of the body have not been accurately diagnosed in the past, or even in the present day, and there is room for careful observation all along this line of diagnosis. Again, Dr. Carstens is at fault when he says: "If the eight cases had been promptly operated upon the (*first day*) seven at least would have recovered, and not been in danger of subsequent attacks." Now, the Doctor assumes that but one might have died, and furthermore he is at variance with all authority when he says operate on the first day of the disease. It will take the first day at least to be sure of your diagnosis. He evidences too great a confidence in his own methods of diagnosis and too vivid a confidence in what the knife can accomplish to justify me in believing he is a careful or methodic student of cases by a careful analysis and classification of symptoms in such cases;

and if I am correct in this conclusion, I am also correct in the conclusion that he is only proving, just what I have hinted at, that a more conservative study and treatment of these cases would save many lives which are not saved by the knife. One of these cases I reported, in which I was called to operate, proved that if he had been operated upon at any period of his recurrent attack, it would have been useless, as the changes produced in the tissues, revealed by postmortem, showed that no operation could have saved him.

Again, I refer Dr. Carstens to a controversy between Dr. Terry of Utica, N. Y. (in the *Medical Times*), and Dr. R. P. Morris of New York, also a warm advocate of the knife and quoted as an authority upon appendicitis.

The case is not settled by Dr. Carstens, nor by any one observer, in favor of the knife, no matter how strongly he states it, yet we believe it will come to be settled, as many other surgical questions are being settled, by a more careful diagnosis and a more careful, conservative treatment, which does not necessarily exclude the operative method, when safely or judiciously applied. My conviction is still, that when a larger number of cases with careful diagnosis and treatment, promptly begun, with a rigid rule of quiet in bed, the statistics will still be largely on the side of recovery by conservative treatment, and I would use this treatment, even with knife in hand, and would operate if I became satisfied I ought. And a man should have the courage of his convictions on either side in harmony with all facts known to exist bearing on the case. I do not here enter into any discussion of the pathology but adhere to my first position, that we are coming to the time when a more enlightened and conservative treatment will yet relegate the surgeon's knife in this and other abdominal troubles to the shelf. I have indubitable proof, in my own experience as compared with other surgeons, that the knife, which was supposed to be the only resort to save life, has failed and patients have recovered without it, and continue to live and enjoy good health.

Comments: *Obiter dicta* in practice are opinions expressed by those who think they know, on points which do not necessarily arise or exist in cases under consideration.

Dicta are to be regarded as of but little authority, on account of the manner or form in which they are presented, and are often given without much or sufficient reflection and without sufficient data. If, says Huston, "general *dicta* in cases turning on special circumstances are to be considered as establishing rule or law, nothing is yet settled, or can long be settled." It has also been said to be a great misfortune that *dicta* are cited (opinions) and then, when gone into print, are taken as absolute propositions. This may be the position our reviewer is in, and yet his *dictum* does not go. It was not supposed that a few cases would settle a rule of statistics, but only as going to make up a large number which guide to the truth.

The facts in the cases reported clearly show that the five cases which recovered were those who received a careful, discriminating treatment, not all by the writer, and those who were lost neither had judicious nor safe treatment, but refused the aid of surgery when offered them, and this puts an entirely different view than the one supplied by Dr. Carstens.

I am not alone among medical men who have grown old in experience who are taking the same view, that the *obiter dicta* of the present generation of younger surgeons does not yet settle questions, but that the statistics which will prove a rule of action to the surgeon are not yet complete and will not be till more cases and more time has been taken to determine them. I only expressed a personal judgment drawn from a large private and hospital experience which a large body of men in the profession now entertain, that the knife has been too handy an instrument, and we want a more careful and methodic study of cases before we rush in "where angels might fear to tread."

Thalamon, one of the younger men in medicine and surgery, has given us a masterly résumé of the subject and in it says, "and moreover, if we take all the forms of appendicitis as they come, without making any distinction, we know with certainty that in 90 per cent. the disease gets well without the aid of the surgeon, which shows that as far as the life of the patient is concerned the immediate progress is not so grave and that one may safely wait." Again, he says: "No precise time can be fixed for an early operation; the limit may vary from the third to the fifteenth day." Carstens says the first day, and there is but one case reported as being operated on in the first twenty-four hours, or first day. This case recovered, and yet how does anybody know that in the progress of the case recovery might not have occurred. I would be glad to know in how many cases which recover the operation was indispensable to save the life of the patient. Can any man answer? "The chances," says Thalamon, "for life offered by laparotomy are not very great and it is probable that the chances are *nil* after the fifth day." Here we must draw a clear distinction between the circumscribed and general peritonitis or hyperacute forms and those not so. The rule of Treves was "not to operate before the fifth day." The question recurs, when is the opportune time and who shall decide but the surgeon who has the case? Evidently Dr. Carstens is one of those who believes in immediate operation or early operation, and thus sets up a standard of his own. One thing now to be noticed is the statement that the operative measure is attended by 2 to 5 per cent. mortality, which is much larger than this. When facts are studied on both sides of the question, viz., statistics of operations and those of non-operative cases, they will show from 10 to 15 per cent. of recoveries after operation, while the results of carefully conducted treatment show a better result, which leads Thalamon to say, "that naturally there has been a reaction against this zeal for use of the knife." And to the apparently triumphant statistics of the American surgeons, physicians have replied by statistics more emphatic and decisive (49 to 51). Yet we are still to remember that statistics will not finally *settle* this question, but judgment, skill in diagnosis, effective control of patient and control of pain in each case, judicious use of remedies in control of inflammation, so-called peritoneal.

R. E. HAUGHTON, M.D.

Proportion of Physicians to Population.

SYKESVILLE, MD., Jan. 24, 1898.

To the Editor:—The statistics quoted in the JOURNAL of January 22 (p. 231) from "Hirschwald's Medical Directory" furnish a good refutation of the reckless statements so often made by careless writers in American medical journals concerning the great disproportion in the number of physicians to population in this and other countries. I have thought it might be of interest to give a comparative statement of the number of physicians to the population in a few of the large cities in the United States and in the German Empire. The figures for the former are taken from "Flint's Medical and Surgical Directory" for 1897 and the "New York World Almanac" for 1897 and 1898, and those for Germany from the work mentioned above. The statistics are as follows: United States: New York, 1 physician to 650 of population; Philadelphia, 1 physician to 661 of population; Chicago, 1 physician to 840 of population; Baltimore, 1 physician to 676 of population. German Empire: Berlin, 1 physician to 780 of population; Breslau, 1 physician to 864 of population; Munich, 1 physician to 798 of population; Frankfort, 1 physician to 795 of population. For the entire German Empire, 1 physician to 2143 of population. For the Kingdom of Prussia, 1 physician to 2184 of population. The population of New York is as estimated on Jan. 1, 1897; that of the other American cities as estimated

Jan. 1, 1898. The German statistics of population are said to be from the latest official census.

It is well known that in American registers of physicians there are many entries of persons who may have the degree of M.D., but who do not practice medicine. Others have the degree of Ph.D., and still others are called Doctor or "Doc" by courtesy. I have gone over the list purporting to give the names of physicians in Baltimore, and find that 4 per cent. have no right there. They are either Ph.D.'s or M.D.'s who have devoted themselves to other pursuits than the practice of medicine. By excluding this 4 per cent. of non-practicing doctors, I find that in Baltimore the proportion of physicians to population is 1 to 704, not very much in excess of the proportion in Berlin. The 4 per cent. eliminated does not include homeopaths, herb doctors, and all other quacks, nor those who have died within the year. I imagine the German statistics only give those who are legally entitled to practice.

There is another point to which I want to call attention. The belief is general in this country that in Germany, and especially in Prussia, no one is allowed to practice medicine without having passed the so-called "Staats-examen." Now, I have good reasons for doubting this, but it may be true. If true, there ought to be some way of finding out beyond question that it is so. Have all the 14,582 physicians practicing in Prussia, or the 2148 practicing in Berlin, passed the Staats-examen? Or, are there persons practicing medicine in Prussia or in Berlin, who have not passed this Staats-examen, which is constantly held up to us for our admiration and imitation? and if the answer to the last question is affirmative, as I believe it will be, where does the great superiority of the Prussian system come in? Very truly yours,

GEORGE H. ROHE, M.D.

A Genuine Department of Health versus Psychic Sanitary Measures; Which?

CHICAGO, Feb. 7, 1898.

To the Editor:—I was curious to learn the purport and meaning of the "Caffery Bill," pertaining to legislation for the hygienic welfare of the people of this county and, after reading the same as published in the JOURNAL (February 5, pages 330-331), I can say that I am utterly opposed to this substitute bill.

To my mind this substitute bill is not what the medical profession nor the great majority of the people of this country desire. It has very little semblance looking toward the establishment of a genuine department of health as a separate branch of our government, and I will venture the prophecy that the views of 90 per cent. of the members of the medical profession throughout the United States are not in accord with this proposed substitute bill which has been suggested to take the place of the bill that has been carefully prepared by the special committee of the AMERICAN MEDICAL ASSOCIATION and which was introduced into the Senate by Senator Spooner of Wisconsin on January 27 last, and is known as Senate Bill 3433.

There may be mugwump bacilli or psychic bacilli that science and sanitarians will have to contend with in the far distant future, but for the present generation at least, we are entitled to, and should be afforded the most ideal and thorough scientific department of health that it is possible to contemplate, exactly on the theory that when any person or any of our national legislators of either house of Congress, or within their domestic fireside are stricken with disease, they desire the best medical skill obtainable.

We are admonished that, presumably within a week or two, this substitute bill known as the Caffery bill will be introduced into the House, and our influence and work must necessarily, for some time at least, now be exerted with representatives in Congress. Shall this be done?

Before closing, I might with propriety propound this query also (which is not intended so much for the aggrandizement of our profession as some might be led to believe).

Would it not be well for the President's cabinet to be dignified by the acquisition of a scholarly and thoroughly scientific medical secretary exactly on the same principle as the presidential family is composed of gentlemen versed in diplomacy in matters of state, finance, the judiciary, the science and art of war, etc.

Let us have a department of health, therefore, as has frequently been outlined in the JOURNAL, on the same theory that if we want a spade, a spade will be provided for us and not a spatula, or if we ask for a stick of wood that a wooden toothpick will not be substituted. Very sincerely yours,

LISTON H. MONTGOMERY, M.D.

Method of Examination of Urine.

OMAHA, NEB., Feb. 3, 1898.

To the Editor:—Apropos of the ingenious method for the detection of casts described by Drs. Haines and Skinner in the JOURNAL of January 29, it may be of interest to describe the method which has been in use in my laboratory for the past few months. I depend entirely on the centrifugal method and use only tubes containing at least 15 c.c. Both tubes are filled to the 15 c.c. mark with the freshest possible specimen of urine and centrifugalized at from 1800 to 2500 revolutions per minute for three minutes; then at least 10 c.c. are withdrawn from the tubes with a pipette, being careful not to shake; the tubes are again carefully filled with the pipette and again centrifugalized; this process is repeated ten or twelve times, so that in about half an hour we have the sediment in each tube from at least 115 c.c. urine, 230 c.c. in all. Then the bottom 3-5 c.c. of both tubes are placed in one tube and again centrifugalized. This method has been especially useful in the examination of urine for tubercle bacilli, where by spending a little more time we often use the sediment from 500 c.c. This method is rapid, thorough and avoids a tedious delay, as well as the necessity for any preserving agent. As a proof of this efficiency I may add that in over 200 examinations of which records are kept, a few casts have been noted in every instance, even in apparently healthy individuals. Respectfully,

AUGUSTUS DETWILER, M.D.

X-Ray Dermatitis; Suit for Damages.

PADUCAH, KY., Feb. 2, 1898.

To the Editor:—In October, 1897, the undersigned was sued for malpractice in the sum of $10,000 for subjecting a patient to the X-rays which produced a severe dermatitis, the plaintiff setting up the claim that the apparatus was carelessly used, and further that the means used was not yet sufficiently well understood as to warrant its use for the purpose of locating foreign bodies, etc. The suit was ably contested and fortunately was decided in my favor, the court holding that in this as in other cases the physician was bound to use ordinary skill and judgment, and placed the case upon the same footing as chloroform anesthesia.

Knowing that there were several suits of this character in the courts I thought perhaps it would be of some interest to report it, since I have as yet been unable to find that the subject has been previously passed upon by the courts.

Respectfully, FRANK BOYD, M.D.

PUBLIC HEALTH.

Louisiana State Board of Health.—The *New Orleans Medical and Surgical Journal*, January, alludes to the fact that that Board of Health is temporarily dismantled, all the members who were in office during the recent outbreak of fever having

resigned. This step was taken on account of the demand of the daily press and various commercial bodies, representing the *vox populi*.

Direct Contagion of Typhoid Fever.—A striking instance is reported from Bucharest, where ninety-six cases of typhoid fever occurred in a crowded military school of 300 inmates, spreading directly from bed to bed. No local cause for the epidemic could be discovered, and it was traced to two pupils who had returned from an infected locality.—*Bull. de l'Acad. de Méd.*, December 21.

Malarial Fatalities on the Southeastern Coast of Africa, in Railroad Building.—Dr. Emil Holub, a South African scientist and explorer, speaking of the new Gazaland railway that traverses a part of the intensely malarial coast line, belonging to the "sphere of influence" of Portugal, says that that railway has earned a sad notoriety by reason of the great loss of life that has marked the course of its construction. During the past five years the contractors have contended with almost insuperable difficulties in procuring sufficient labor. More than seven hundred workmen have died from malarial fevers. Some of these were from Europe, but the majority were Asiatic natives. Out of 500 Afghans imported for this work, by way of India, 350 died in a short time. The divide between the shore line and the inner lofty tableland has been passed and the death-toll has been greatly reduced.

Death Rates of the Past and Present.—One of the events of the British Jubilee was the presentation of an address by the Lord Mayor and Sheriffs of London to the Queen on the subject of the sanitary improvements during her reign. The summary as ably condensed in an issue of the *New York Sun*, brings forth some startling facts. In Macaulay's comparison between the London mortality of 1844 and that of 1684, it appears that the death rate of 1685, not a sickly year, was between 43 and 44 per thousand, or one in every twenty-three. At the present moment the London death rate is 14.9 per thousand despite the enormous increase in the population. During the ten years from 1838 to 1847 the mean annual death rate for England and Wales was 22.16 per thousand while the ten years from 1881 to 1890 was 19.1 per thousand. This implies that 77,000 out of an estimated population of 29,000,000 were kept alive in each year of the latter period who would have died in each year of the former. All of which proves the value of mathematical precision in the calculation of life-values as affected by surroundings and the diffusion of intelligence.

New York State Board of Health.—Before the above named board Dr. George B. Fowler, on behalf of the Antitoxin Committee, has reported that the committee has notified the various manufacturers of antitoxin as to State supervision of its manufacture and sale in New York State. The manufacturers he said were in hearty sympathy with the board, and promised to aid it in the carrying out of the plan to have antitoxin tested before it was offered for sale. In the absence of reports on the subject from local bacteriologists the matter was adjourned for one month. The State Board will probably determine to have all the bacteriologic work done in the laboratory of the Health Department of New York City before the serums can be placed on sale as officially approved remedies. This is the plan pursued in Europe where every ounce of serum is inspected by duly authorized officials in the state laboratories. Dr. Herman M. Biggs, bacteriologist of that department is reported as saying that as a result of investigations he found several of the samples of serum submitted to him unfit for use owing to the occurrence of decomposition. Some of it was considerably below the standard strength.

The Latest in Regard to Beriberi.—A committee was sent from Holland to study the three epidemics of the diseases supposed to be beriberi at the Richmond Insane Asylum at Dublin, and their report has just appeared in the *Nederlandsch Tidjschrift voor Geneeskunde* for December 11. While they are not too positive, as a disease may assume different characteristics in different countries, yet they do not consider the epidemic polyneuritis at Dublin identical with the beriberi of the Netherlands colonies. The localizations are different; the extreme relaxation of the articulations observed at Dublin, "dropped wrists and feet," is unknown in the East Indies, and other symptoms are quite different. *Janus* (Vol. ii, No. 1) contains the results of an investigation of the hundred indigenous prisons in Java (280,000 inmates), with a view to determining the influence of the food on the appearance of the disease. The results are striking. The principal article of food is rice; in some prisons it is used with the pericarp, in others completely shelled. Where it is completely shelled the proportion of cases of beriberi to the number of prisoners is 1 to 39; where the pericarp is eaten with it the proportion is 1 to 10,000; where a mixture of the two kinds is used the proportion is 1 to 416. Further statistics show the disappearance of the disease in institutions in which the unshelled rice has been substituted for the shelled. In Japan, he states that the rations for the army and navy now include a certain proportion of barley and bread instead of the previous exclusive rice rations and beriberi has almost entirely disappeared.

Experiments in Disinfection at the New York Harbor Quarantine.—Experiments with formaldehyde gas are in progress at the quarantine station at New York, the principal tests having been made with the micro-organisms of cholera, diphtheria and the plague, on board the new steamboat belonging to that office. Other tests were made in a room in the laboratory which had been especially supplied for the purpose with an apparatus for spraying liquefied ammonia all about the room, in order that the gas might be neutralized whenever it was necessary. In the account of his experiments, the Health officer, Dr. A. H. Doty, describes twenty-five separate tests, in each of which three or more varieties of germs were used. Some of the experiments were made in a room of moderate size, containing about 1,000 cubic feet of air space. Others were in an air-tight steel box containing about 115 cubic feet of air space. In the series of experiments made with the steel chamber, the disinfecting solution in amounts ranging from eight to ten ounces, was exposed for different periods of time. Into a woolen blanket, cultures of different germs were rubbed, and in fifteen tests in which the quantities as well as the periods of time were varied, only one culture of the germs showed any signs of growth subsequent to the exposure to the solution. That was the diphtheria germ. Tests were next tried *in vacuo* as that method offered less resistance to the penetration of the gas. For twelve hours he exposed a quart of the solution. He used the germs of the Indian plague, of diphtheria and of anthrax. Some were exposed on linen, some were wrapped in a blanket, and others wrapped in a newspaper. These lived under the exposure to the gas, while others inside an envelope between a single sheet of paper, and inside a towel, were killed by the gas in nearly every case. A greater degree of success was met in subsequent experiments, in which it was learned that the gas was given off more satisfactorily by the use of a solution of some neutral salt. The apparatus was set up in the disinfecting steamer, and after four hours' exposure, every germ of cholera, plague and diphtheria was killed. These results were obtained when the germs were inside as many as three sheets of paper and envelopes, and were closed as tightly as possible. Fully four hours were needed, however, to make the tests successful. The value of the new disinfectant will be appreciated most at our harbors as a means of disinfection against southern ports. Already the mail tests with formaldehyde have been highly successful, and it is efficacious, too, in the case of blankets, towels and newspapers. It is said to have no bad effect on animal life and can be used without detriment.

The Department of Public Health.—The State Board of Health, of Indiana, has issued the following special circular:

The following resolution was passed by the Indiana State Board of Health at its regular meeting December 17, 1897:

WHEREAS, An urgent necessity exists for a more entended supervision and control of contagious and infectious diseases, to prevent the introduction of said diseases into the United States and the spread from one State to another of the same; and

WHEREAS, A bill to establish a National Department of Public Health and define its duties has for the past ten years been under serious consideration by the AMERICAN MEDICAL ASSOCIATION, also by the Public Health Association; and

WHEREAS, At the last meeting of the AMERICAN MEDICAL ASSOCIATION a report presenting a bill was adopted, and at a meeting of the Public Health Association held in Philadelphia, Oct. 29, 1897, said bill to establish a department was also adopted; therefore be it

Resolved, by the State Board of Health of Indiana, that we heartily concur in the action of the Associations herein named and earnestly request the co-operation of all who favor sanitary reform to urge upon Congress the necessity of passing the measure, thus insuring a more efficient and uniform control of infectious diseases.

Ordered: That the Secretary shall have this resolution referring to a bill to establish a National Department of Public Health and to define its duties, printed. And that he shall send the same to every State Health Officer in Indiana, requesting said officer to use his influence to promote the bill, and he shall further send a copy of the resolution to each member of all State Boards of Health. J. N. HURTY, Secretary.

The Vaccine Laboratories of Germany; A "Germ-free" Lymph not yet Attained.—Dr. Huddleston of the New York City Department of Health, states that the best European laboratories of this kind are to be found in Germany. While calf lymph is almost universally used upon the Continent, in England very little progress has been made; the latter country has not as yet outgrown the experimental state. The laboratories of Germany are under government control. The percentage of successful vaccination in Berlin is 96.84; in Hamburg 94.85. The best laboratory in buildings and equipments is that of Cologne, which the author described at length. At Hamburg vaccination of 1700 primaries with "germ-free" lymph gave eight cases of skin eruptions. The Imperial Berlin Commission recently reported, that in its judgment, inflammatory appearances are due: 1, to the condition of the person vaccinated; 2, to the greater or less amount of effective lymph in the material applied, and 3, to the technic employed in the inoculation. The commission stated that inflammatory complications are especially frequent if the incisions made in the inoculations are numerous, long, deep and close together. It is a familiar fact that inflammation is more frequent in secondary than in primary vaccination. It is also unfortunately the case that a number of German reports state that quite enough disinfection of the arm by means of sublimate solution and ether before vaccination does not prevent all inflammatory complications, but in some cases has actually seemed to increase them. Nevertheless it has been a great advantage to vaccine production that practically "germ-free" lymph may be obtained; because the germs present, while as a rule non-poisonous, are it is thought injurious to the vaccine organism, and it is a fact that by employing "germ-free" lymph the so-called "purulence" in the producing animals, one of the former bugbears of the vaccine laboratory, has practically disappeared. Laboratory workers have about come to the conclusion that it is at present impracticable to produce a sterile vaccine, but two different and partially effective methods of bringing down the number of germs have been discovered. One method consists of centrifugalization of virus which has been diluted with water, and the second, of mixing the virus with varying proportions of glycerin. The former method reduces the number of bacteria present but does not entirely remove them; the latter is much more effective, and by means of it the number of germs in lymph as tested by making cultures on agar, can always be materially reduced within a period which varies from a few days to a few weeks. Sometimes this does not secure sterility, but when old glycerinated virus is not sterile the inference simply is that the germs present are such as resist the action of glycerin; the bacillus subtilis, for instance, which is non-pathogenic is unaffected by glycerin. It may then be fairly stated that lymph practically, although not absolutely "germ-free," can be secured with considerable certainty. The results from the use of this so-called "germ-free" lymph, whether absolutely sterile, have not, however, secured freedom from the inflammatory complications of vaccine. On the contrary it is the general testimony given by those who have experimented at length with such lymph that inflammatory reactions occur in about the same proportion of cases as before this lymph was introduced, and also that not merely inflammatory complications are present, but occasionally vaccinal eruptions as well, as has already been stated above regarding the Hamburg experiments. Finally, it should be added that while every brand of vaccine has its own bacterial flora, the few germs which are common to almost all are very clearly non-pathogenic to men or animals. Repeated inoculations of germ-bearing lymph have been made in guinea-pigs, rabbits and other test-animals, and almost invariably without any pathogenic results.—*Medical News*, January 1.

ASSOCIATION NEWS.

Denver Accommodations.—The following is a partial list of hotels and rooming houses with rates agreed to for the Denver meeting of the AMERICAN MEDICAL ASSOCIATION, June 7 to 10, 1898.

Brown Palace Hotel, 17th Street and Broadway. Take 17th Street car, to Hotel. European plan, $1.50 per day; American plan, $3.50 to $5 per day.

The Albany, 17th and Stout Streets. Take 17th Street car to Stout Street. American plan, $2 to $3.50 per day.

L'Imperial Hotel, 14th Street and Court Place. Take Colfax Avenue car to Court Place, American plan $2 to $3 per day.

Windsor Hotel, 18th and Larimer Streets. Take 17th Street car to Larimer. American plan, $2 to $3.50 per day.

The New St. James Hotel, Curtis Street, near 16th Street. Take 16th Street car to Curtis Street. American plan, $2 to $3 per day.

The Oxford Hotel, 17th and Wazee Streets. Two blocks above depot. European plan, $1 to $3 per day.

American Hotel, 16th and Blake Streets. Take 16th Street car to Blake Street. American plan, $2 per day.

New Markham Hotel, 17th and Lawrence Streets. Take 17th Street car to Lawrence Street. European plan, $1 per day and upward.

Metropole Hotel, Broadway near 17th Street. Take 17th Street car to Broadway. European plan $1 to $2, single room, per day.

Hotel Broadway, Cheyenne Street and Broadway. Take Colfax Avenue car to Cheyenne Street. American plan $1.25 to $1.50 per day.

The Vallejo, 1420 Logan Avenue. Take Colfax Avenue car to Logan Avenue. American plan, $2 per day and upward.

The Devonshire, 14th and Logan Avenues. Take Colfax Avenue car, to Logan Avenue. American plan, $1.50 per day and upward.

The Albert, 17th and Welton Streets. Take 17th Street car to Welton Street. European plan $1 to $1.50 per day.

The Aldine, 1013 17th Avenue. Take 17th Street car to Ogden Street. American plan $1.25 per day.

The Richelieu, 1727 Tremont Street. Take 17th Street car to Tremont Street. European plan, $0.50 to $1.00 per day.

The Earl, 1430 Tremont Street. Take Colfax Avenue car to Tremont Street. American plan, $1.50 to $2 per day.

Glenarm Hotel, Glenarm and 15th Streets. Take Colfax Avenue car to Glenarm Street. European plan, $1 per day and up.

The Bonaventure, 18th and Glenarm Streets. Take 17th

Street car to Glenarm Street. European plan, $0.50 to $1.50 per day.

The Drexel, 17th and Glenarm Streets. Take 17th Street car to Glenarm Street. European plan, $0.75 to $1.50 per day.

For reservation of rooms please apply to hotel direct. For especial information address, ROBERT LEVY, M.D., California Building, Chairman Committee on Hotels.

SOCIETY NEWS.

The American Medico-Psychological Association. — The fifty-fourth annual meeting of the American Medico-Psychological Association will be held in St. Louis, Mo., May 10–13, inclusive. C. B. Burr, secretary.

The Fifth District Branch of the New York State Medical Association will hold its fourteenth annual meeting at 315 Washington Street, Brooklyn, on Tuesday, May 24, 1898. Gonorrhea will be the subject for papers, discussions, and reports of cases. Robert W. Taylor will open the subject by giving the pathology and treatment in males. J. W. S. Gouley will treat of urethral strictures, William E. Beardsley of gonorrheal rheumatism and Lawrence Coffin of gonorrheal ophthalmia in adults. William McCollom will discuss the "Moral Prophylaxis and the Ethical Duty of Physicians to the Public;" J. C. Bierwirth the "Medico-legal Responsibility of Physicians to Their Patients and Patients' Friends." L. Grant Baldwin will give the symptoms and diagnosis of gonorrhea in females and will be followed by Walter B. Chase and Frederick H. Wiggin on the palliative and operative treatment. N. L. North, Jr., will present the subject of "Gonorrheal Ophthalmia of Infants" and will be followed by R. Mathewson and L. A. W. Alleman on the same subject. N. W. Leighton, president; E. H. Squibb, secretary.

BOOK NOTICES.

An Epitome of the History of Medicine. By ROSWELL PARK, A.M., M.D,, Professor of Surgery in the Medical Department of the University of Buffalo, etc. Illustrated with Portraits and other Engravings. One Volume, Royal Octavo, pages xiv, 348. Extra Cloth, Beveled Edges, $2.00 net. The F. A. Davis Co., Publishers, 1914 and 1916 Cherry Street, Philadelphia; 117 W. Forty-second Street, New York; 9 Lakeside Building, Chicago.

This is an excellent work and should be in every physician's library, as up to a recent time the history of medicine has been greatly neglected, but within a few years numerous works have appeared on the subject.

The work is well illustrated, portraits being given of many of the noted medical men. It is not only of interest to physicians and medical students, but to laymen as well. And this brief work, while it does not aim to be anything but an epitome, gives a fair understanding of the subject.

It is open to criticism in some respects. Hardly enough credit has been given to surgeons of the Arabic period, but in the main there is little from which to dissent and as a whole we have nothing but commendation.

A System of Practical Medicine. By American Authors. Edited by ALFRED LEE LOOMIS, M.D., late Professor of Pathology and Practical Medicine in the New York University, and WILLIAM GILMAN THOMPSON, M.D., Professor of Medicine in the New York University. To be completed in four imperial octavo volumes, containing from 900 to 1000 pages each, fully illustrated in colors and in black. Volume III.—Diseases of the Alimentary Canal, Peritoneum, Liver and Gall Bladder, Spleen, Pancreas and Thyroid Gland, Chronic Metal Poisoning, Alcoholism Morphinism, Infectious Diseases Common to Man and Animals, Miscellaneous Subjects. For sale by Subscription. Per volume, Cloth, $5.00; Leather, $6.00; Half Morocco, $7.00. Lea Brothers & Co., Publishers, Philadelphia and New York, 1898.

The contributors to this third volume are: Richard Cabot, M.D.; Warren Coleman, M.D.; George Dock, M.D.; Frederick Finley, M.D.,; J. E. Graham, M.D.; H. A. Hare, M.D.; Walter James, M.D.; William W. Johnston, M.D.; Allen A. Jones, M.D.; Francis Kinnicutt, M.D.; Alexander Lambert, M.D.: J. Law, F.R.C.V.S.; George Roe Lockwood, M.D.; Henry Lyman, M.D.; W. T. McNutt, M.D., M.R.C.S. Edin., etc.; Allen M. Starr, M.D.; James Stewart, M.D.; Charles Stockton, M.D.; Victor C. Vaughan, Ph.D., M.D.

The topics include: Diseases of the alimentary canal; diseases of the peritoneum; diseases of the liver and gall bladder; diseases of the spleen; diseases of the pancreas; diseases of thyroid glands; chronic metal poisoning; alcoholism; morphinism; infectious diseases and miscellaneous subjects. The high standard set by the predecessor of this volume has been maintained in the present and we have no hesitancy in recommending the book as conservative, judicious and instructive. There is a copious index at the conclusion of the volume which is well printed on excellent paper with clear type.

Outlines of Rural Hygiene. For physicians, students, and sanitarians. By HARVEY B. BASHORE, M.D., Inspector for the State Board of Health of Pennsylvania. With an Appendix on The Normal Distribution of Chlorine by Prof HERBERT E. SMITH, of Yale University. Illustrated with Twenty (20) Engravings. 5½ x 8 inches. Pages vi–84. Extra Cloth, 75 cents net. The F. A. Davis Co., Publishers, 1914-16 Cherry Street, Philadelphia; 117 W. Forty-second Street, New York City; 9 Lakeside Building, 218-220 S. Clark Street, Chicago.

This little work is intended to throw light in dark places and to call attention to the neglect of sanitary rules in districts outside of the great cities. The scope of the work is as follows: Water-supply, waste disposal, the soil, habitations, disposal of the dead and normal distribution of chlorin.

The work is well illustrated and is undoubtedly very useful for the classes for whom it is intended.

There is certainly room for missionary work in the direction indicated.

A Manual of Obstetrics. By A. F. A. KING, A.M., M.D. Seventh Edition, with 223 illustrations; pp. 574. Lea Bros. & Co.: Philadelphia and New York, 1898.

When a work has passed its seventh edition it requires but little additional notice except to say that it has been brought up to date and has in no wise degenerated; and the author says in his preface that in the present revision some errors and omissions have been rectified, and additions introduced; the chapter on "puerperal septicemia" has been rewritten, and throughout the work an effort has been made to accentuate the importance of antiseptic midwifery with more emphasis than formerly. This work, which has grown from the date of its first appearance, has now become a volume containing matter enough to make a book twice the size if printed in larger type, and indeed it may be said that the amount of material contained in this compacted form is more than equal to some more pretentious books.

The teachings of the writer are sound and judicious and that careful condensation which made the first volume a favorite with the profession is continued in this.

A Living Substance as Such, and as Organism. By GWENDOLEN FOULKE ANDREWS. Supplement to Journal of Morphology. pp. 176. Ginn & Co.: Boston. The Athenaeum Press, 1897.

This work is a philosophic study, from a biologic standpoint, of the living substance. The work was carried on partly at the Marine Laboratory at Wood's Holl, Mass., and partly at the University of Pennsylvania.

The rapidly changing protoplasm is an evanescent structure to fix and classify, and camera drawing of the finest structure-phenomena the author finds impossible. "Of the living substance-phenomena," says the author, "it is about as practicable to reproduce it as it would be to trace upon a wall reflections thrown from disturbed water. Some camera drawings of the filose phenomena in starfish and ecchinus eggs were made, but such can show by direct tracing larger masses only of the sub-

stance and are in point of time and relation true but to a limited extent. It follows from the very nature of these phenomena, as will be seen, that they can not be traced; for while the hand follows the minutest portion the relations of the whole will have undergone a change with important transpositions and transmutations of both structure and substance. In point of minuteness also many of the facts which can be optically noted defy camera tracing since the finest steel point is still too coarse for the work."

Notwithstanding these defects, the existence of the visible protoplasm structure has given good definite results which the author sets forth at some length in the volume under consideration.

The Aphasias and their Medico-Legal Relations. By F. W. Langdon, M.D., Cincinnati, pp. 42. Norwalk, Ohio, 1898.

This monograph is a paper read before the Ohio State Medical Society at its Fifty-second Annual Meeting at Cleveland, Ohio, May, 1897.

It is of great interest and well illustrated. The author concludes that in the case of aphasia, if the sanity of the individual is established any legal document should be recognized, when he can understand fully its nature by any receptive channel, viz., hearing, visionary or muscular senses, and can in addition express assent or dissent, whether this expression be by spoken speech or pantomime, or written speech: Opinions which must be regarded as sound.

Proceedings of the Kansas Medical Society. Paper. 104 pages. Topeka, 1897.

This volume contains the proceedings of the Thirtieth annual meeting held at Topeka, May 13, 14 and 15, 1896; also of the thirty-first annual meeting. The report, however, does not include the papers and discussions.

NECROLOGY.

Charles R. Taber, M.D., Fort Motte, S. C., January 27, aged 60 years. He was a delegate to Cuba, by the State, for the purpose of investigating yellow fever and its causes, and the best means of preventing its introduction into the State. In 1888 he was a delegate to the International Medical Congress in Berlin, and was for years president of the State Medical Association and at the time of his death president of the State Board of Health.

Gerard C. Paoli, M.D., Chicago, January 29. He was born in Triondheim, Norway, June 23, 1815. In 1832 he went to Christiania and there pursued literary and scientific studies for two years, after having previously graduated from a university. In the middle of his post-graduate course he was appointed an assistant to the district physician. After six years' study in Christiania he went to Stockholm. One of the acquaintances he then made was Ole Bull, whom he afterward knew intimately in this country. Dr. Paoli resided in London for a while, making diligent observations in the hospitals, then came to this country. Twice he was president of the Chicago Medical Society, twice its vice-president, and he assisted materially in establishing the Woman's Medical College and the Scandinavian Medical Society.

Isaac Massey, M.D., West Chester, Pa., January 31. He was born in 1838. His grandfather, Israel Massey, was a lifelong resident of Valley Forge, where he owned the land upon which Washington's headquarters were situated. Dr. Massey was a member of the Board of Trustees of the House of Refuge at Glen Mills, one of the staff of physicians at the Chester County Hospital, a member of the College of Physicians and Surgeons of Philadelphia, and a member of the Pennsylvania State Medical Society and the Chester County Medical Society.

Samuel T. Spees, M.D., Tuscola, Ill., January 29.——Edward W. Riley, M.D., Kansas City, Mo., January 27, aged 47 years.——John Sarms, M.D., Gallipolis, Ohio, January 29, aged 73 years.——Louis Pagin, M.D., South Bend, Ind., January 20, aged 80 years.——Michael Talbot, M.D., Niagara Falls, N. Y., January 26, aged 52 years.——E. C. Johnson, M.D., Hammond, Ind., February 5.

MISCELLANY.

Antistreptococcus Serum.—Belfanti and Carbone have established that this serum protects only against infection by the same variety of streptococcus. The question of the variety of the streptococcus is therefore of supreme importance in treatment.—*Cbl. f. Chir.*, Dec. 31, 1897.

A Nurse Honored.—The decoration of the Legion of Honor has just been conferred upon Miss Bottard who for fifty-six years has served in the nervous disease service of the great Paris hospital of la Salpetrière, under Charcot for many years, who ascribed much of his success to her unparalleled devotion. Several times, three years have passed without her leaving the premises.

A Double Current Urethral Sound.—A groove along one side of the canula, which is a glass tube about seven centimeters long and twelve millimeters in diameter, allows the fluid to flow back into the receptacle provided without soiling the clothing. A projecting rim on the outer end prevents the canula from entering farther than the anterior urethra.—*Bull de l'Acad. de Méd.*, December 21.

Change of Name and Location.—The British Institute of Public Health will be styled in future the Royal Institute of Public Health, and Her Majesty the Queen has been graciously pleased to accept the office of patron. The council of the Institute has conferred the Harben Gold Medal for 1898 upon Lord Playfair, and has appointed Dr. W. R. Smith the Harben Lecturer for 1899. The offices of the Institute have been removed to 197, High Holborn, London.

Improved Lodging Homes.—The new Mills House No. 1, in New York City, is a great success as a poor man's hotel, and is likely to pay a good dividend. In London the same field is being covered by the Rowton House, and another was opened three weeks ago which will provide good clean beds for 800 men, at sixpence a night, or for ten shillings a week, with board. They are always full, and they pay, for 800 sixpence a day means £7300 a year.

The Hoagland Laboratory, Brooklyn, N. Y.—Dr. C. N. Hoagland has again made a donation to the above named institution, by way of a New Year's gift, by the conveyance of a security valued at $24,000. Dr. Hoagland's benefactions to the cause of scientific research are said to have reached a figure considerably in excess of a quarter of a million of dollars during the last ten years. Dr. Ezra H. Wilson, who has for four years been the bacteriologist in chief to the local department of health, has resigned from his sanitary position to devote his time fully to the conduct of this Laboratory.

Improved Appliances for the Sick.—A new lifting appliance fits directly on the four posts of the bed, which are extended upward for the purpose. The patient lies permanently on the broad linen support, parts of which can be unbuttoned as required to allow access to any part of the body. It adds very little to the weight of the bed. P. Jacobsohn has also devised a simple wheeled frame that can be applied to any bed to enable it to be wheeled lightly about. It consists of two light horizontal iron frames, forming two superposed hollow squares. The lower is fitted with rubber wheels. A stout jack-screw at each end turned by a single crank, pushes the two frames apart and raises the bed off the floor. Another appliance of his invention is a light iron frame with a jack-screw, which can be applied under the foot or head of the bed and raise

that end to any level desired without danger of jarring the patient. Iron hooks grasp the bed and the frame rests solidly on the floor.—*Deutsche Med, Woch.*, January 6.

Statistics of Anesthetics at the Italian Congress of Surgery.—Three deaths were reported, but two are dubious, and only one was a typic case of chloroform intoxication, out of 3760 cases of general anesthesia; chloroform was used in all but eight. Six hundred and thirty-seven operations without anesthesia were reported; 292 with local anesthesia. A case of icterus consecutive to chloroform was reported, with serious nervous phenomena, which grew worse with the administration of chloral, but gradually passed away (*Gaz. d. Osp. e d. Clin.*, November 14). Combining the Italian statistics for the last two years, there were thirteen deaths in 53,992 chloroform anesthesia, and one death in 2802 with cocain.

Coincidence of Epilepsy and Diabetes.—W. Ebstein reports several observations of epilepsy coinciding with diabetes mellitus decipiens, and urges investigation of the urine of epileptics, especially in the Jacksonian form, as the glycosuria frequently escapes notice.—*Deu. Med. Woch.*, January 6-13. We note also a communication by Orlandi in the *Gaz. de Osp. e d. Clin.* of December 26, reporting a case of Jacksonian epilepsy accompanied by an enormous amount of aceton in the urine and blood. He established experimentally that the intoxication could not be attributed to the aceton, but that the latter was simply a symptom of another intoxication.

Physicians in Public Life.—The present French Senate numbers thirty-nine physicians and three veterinarians among its 300 members, while in the Lower House there are fifty-eight physicians, two veterinarians and four druggists to the 581 deputies, a proportion of one to nine. In Germany the proportion is very much less—one to sixty-six (1893). In the last ten years France has had physicians in the cabinet; ministers of the navy, interior and of agriculture. Among the better known members of the legislature are Professors Cornil and Lannelongue, and the popular surgeon Labbé. Trelat, Trousseau and Malgaigne were also senators in their day. The French legislator is usually first the mayor of his town or occupies some other public office (in Paris, member of the city council), thus showing the remarkable interest taken by the medical men of France in public affairs and politics and the esteem in which they are held. (From Paris letter in the *Deu. Med. Woch.*, December 23.) Italy has twenty-three physicians in the legislature, including six professors.

The Passage of Solid Particles and Air from the Bladder into the Kidneys, etc.—Professor L. Lewin announces in the *Deutsche Med. Woch.* of December 23, that he has established by experimental tests that air and solid bodies (ultramarine blue or green rubbed into a gum arabic solution, etc.) introduced into the bladder, find their way by mechanical or peristaltic action, or both, through the ureters into the kidneys, and from there through the uriniferous tubules, the lymph spaces and the blood vessels into the circulation, the heart, pulmonary vessels and even the liver. If the renal vein is severed after being ligated toward the center, and ultramarine green is injected into the bladder under high pressure, it soon appears in the fluid issuing from the vein. He proves thus that there is natural communication between the bladder and the heart, which allows the passage of air and solid particles, much more of living micro-organisms, and explains many sudden deaths from embolism and certain general infections.

Spontaneous Sediment Formation in the Blood.—Biernacki adds to his previous communication in regard to this means of clinic investigation (*vide* JOURNAL, Dec. 25, 1897), that he has never known a case of functional neurosis to fail to present an abnormal sediment formation. In the neurosis in which neurasthenic symptoms predominate, with or without nervous dyspepsia, the sediment forms exceptionally slowly, and the assumption that this phenomenon depends upon abnormal processes of oxidation, is confirmed by the fact that the venous blood in these cases is much brighter colored than usual. On the other hand, functional neurosis in which the hysteric symptoms predominate, shows exactly the opposite: the sediment forms with extreme rapidity and the amount of sediment is small. These results have been constant in the thirty cases examined, and cast a new light upon functional neuroses, and possibly upon their etiology. They also furnish a new means to detect simulation. He asserts that abnormal sediment formation is the most delicate of all tests, as every one organ affected will disturb the sedimentation, although the individual is otherwise in normal conditions. In hyperglobular blood the sediment forms slower than in normal, while the process is abnormally rapid in blood poor in corpuscles and hydremic.—*Deutsche Med. Woch.*, December 30.

The Jewish Population of the United States.—The American Jewish Historical Society has published a note on the above subject, in which some interesting statistics are presented. Twenty years ago the first systematic attempt to obtain definite statistic information was made by the Board of Delegates of the American Israelites, with the assistance of the Union of American Hebrew congregations. Incomplete reports secured showed a Jewish population of 189,756. By 1880 these figures had increased to 230,257. The total population of the country in that year was 50,155,783. It is calculated that since 1880 something over 485,000 Jews have immigrated to the United States. This addition, together with the increase through births, gives at a conservative estimate a present Jewish population of 938,000. The total population of the country is now estimated to be 75,000,000. In other words, it is one-half larger than it was seventeen years ago, while the Jewish population is more than four times larger. The Jews are not numerous in agricultural States. Their greatest numbers are in States having large cities, as, for instance, New York, 350,000; Pennsylvania, 85,000; Illinois, 85,000; Ohio, 50,000; California, 85,000; Maryland, 35,000; Missouri, 25,000; New Jersey, 25,000; Louisiana, 20,000; Massachusetts, 20,000.

Importance of Chromatolysis.—The complexity of the nerve-cell and the dissolution and disappearance of the chromatophilous elements, to which the term chromatolysis has been applied, were among the most interesting subjects treated at the last International Congress (*vide* JOURNAL, Vol. 29, pages 695 and 745). Recently, Van Gehuchten has demonstrated that this chromatolysis is observed whenever a sensory or motor fiber is severed, ligated or compressed. The motor fiber gradually returns to its normal condition, but the sensory fiber degenerates and disappears. He ascribes this difference to the fact that the lesion of the peripheric prolongation of the sensory cell deprives the latter of all external excitation. External excitation is therefore evidently indispensable to the anatomic integrity of the cell, and it perishes without it. As excitation from the external world is thus indispensable to the preservation of the neuron, upon which all the tissues and organs depend, it follows therefore that the life of the nerve-cell, and hence the life of all the elements that constitute our organism, is impossible without excitation from without.—*Gaz. d. Osp. e d. Clin.*, January 11.

Condemnation of the Office of Coroner.—The following is a part of a recent presentment of grand jury of the County of Kings, New York: "We have also investigated the methods in vogue in the office of the coroners. It is proper, however, to say that we have not taken up the methods in vogue under the present coroners, but only for the time prior to their taking office. We recommend to the legislature of the State that the office of coroner be abolished. We believe, from our investigation, that the office is useless, that it has no practical

effect in the ferreting out of crime; that the methods in vogue in that office during the time of our investigation are open to the most severe censure; the manner of conducting the business was inefficient, and the powers of the coroners were delegated to subordinates whose chief functions seem to be to get rid of the business and collect the fees incident to the office, for their chiefs. We believe that the continuance of the coroner's office in its present shape, as the law now stands, will lead to further abuses; that the law governing the rights, duties and obligations of coroners is not clear nor specific; that the very fact that various interpretations as to the rights and duties of the coroners may be put upon the law by those who should be familiar with it, will lead to abuses which only the entire abolition of the office can wipe out."

Suture of the Tendons.—Delamare reports a case of secondary suture of the extensor tendons of the three last fingers to the extensor tendons of the index, it being impossible to find the central ends of the severed tendons. The functional result was excellent.—*Gaz. Méd. de Paris*, January 1.

"Virchow's Archiv" completed the fiftieth year of its existence December 29, with the one hundred and fiftieth volume. A banquet on this date in honor of Virchow and the jubilee of the *Archiv*, was arranged by a committee presided over by Professor v. Bergmann, to which the members of all the medical faculties and of all the medico-scientific societies in Germany were invited.

Unna's Prize.—There was no competition for this prize in 1897, consequently the amount offered, 300 marks, is doubled, and 600 marks are now to be awarded for the best contribution on the subject announced: "An investigation whether and to what extent all the stains considered specific for elastin will also stain elacin." Send communications to the care of Leopold Voss, Hohe Bleichen 34, Hamburg, before December, 1898.

Our Aryan Origin.—According to a recent communication to the Paris Société d'Anthropologie, based on the latest ethnic and philologic research, and archeologic data, including much personal work, Zaborowski locates the Aryan country in the plains of the north of Europe extending to the limits of Asia, and ascribes to the blonde Cymri the principal rôle in the founding of the Aryan race.—*Progrés Méd.*, December 25.

Potassium Permanganate and Argonin in Gonorrhea.—By combining these two remedies, Stark reports that a much more prompt and effective action is secured. The daily rinsing with the permanganate softens the tissues of the urethra and favors the penetration of the argonin, which is injected three times a day in a 2 per cent. solution.—*Semaine Méd.*, December 29.

Length of Life of Anthrax Spores.—It has been demonstrated at Professor Petrone's Institute of Path. Anat. at Catania, that anthrax spores retain their vitality twelve years, and not until after thirteen years were guinea pigs safe from infection by inoculation. But their virulence is not as great during the latter years, so that the larger animals and man could scarcely be infected by anthrax spores eight or ten years old.—*Gaz. d. osp. e d. Clin.*, January 6.

Concentration of Therapeutic Sera by Freezing.—Dr. Buywid has been engaged in experiments with diphtheria and tetanus antitoxin preparations in order to obtain concentrated solutions. The dried preparations are, in the minds of many, unreliable and under certain circumstances may be dangerous. A partial evaporation of sera at a low temperature gives a cloudy product. A better method consists in freezing the remedy. The ice is clear and there remains only a small amount of a brownish liquid in the bottom of the glass. If the glass of serum is allowed to freeze slowly the upper layer is without color and contains little beside pure water. The lower layer is a clear, bright yellow and contains almost all of the antitoxin. The two are readily separable.—*Centralblatt für Bacteriologie.*

Birth in Coffin.—A woman was found drowned, six months pregnant. After burial a murder was suspected and the coffin reopened, when the inverted uterus was found between the thighs of the corpse with the body of a fetus 36 cm. in length. The two theories proposed: that the accumulation of gases in the abdomen forced out the contents of the uterus, or that this was accomplished by post-mortal contractions of the uterus, are both considered improbable by Bleich who reports the case.—*N. Y. Med. Woch.*, December 1, from *Vierteljahrsschrift f. Ger. Med.*

The Two-hundred Guinea Fee.—When railroads had become general throughout the country it was felt by some of the leading physician and surgeons of the metropolis that an easier, less tedious and less expensive mode of traveling ought in fairness to the public to be met by some reduction in the rate of remuneration, and after a full consideration of all the circumstances it was concluded in sequel to a conference between Dr. Paris and Sir Benjamin Brodie, on the part respectively of the College of Physicians and of the College of Surgeons, that a reduction of one-third would be fair to all parties and meet all the requirements of the case, and thus that a physician's journey of 300 miles would imply a fee of 200 guineas in the place of 300, as it had previously done.—The "Life of Sir Henry Halford."

Riot over a Missionary Hospital.—At Jerusalem the Jews have been the causers of no little turmoil, and a missionary hospital of British extraction has been the storm center of trouble for this reason mainly, because the meat served to the patients was not known to be *kosher*. If the inferior rabbis could have induced or compelled the hospital authorities to employ Jewish slaughterers there would, it is stated, have been no riot, bloodshed nor arrests. A few pence difference one way or the other would have made the difference between peace or riot. The *kosher* argument, as it is called, is used as a convenient cloak for very trivial financial enterprises; a fraction of a cent per creature slain by the religious butcher, is sometimes all that comes into the coffers of the rabbi, and yet this picayune profit may become the source of much contention, confusion and sometimes of crime from the Gentile standpoint of view.

The Diazo-Reaction in the Urine of Infants.—As the result of numerous and painstaking investigations, Umikow announces in *Wratsch* (Nos. 39 and 40), that the diazo-reaction never appears in the urine of healthy infants. Fever has no influence upon its appearance. It never appears in pneumonia, diphtheria, intestinal catarrh, chickenpox, otitis media, eczema of the face, inflammation of the lymphatics, congenital syphilis, bronchitis, laryngitis, pleuritis or rhinitis. On the other hand, it is invariably present in erysipelas and measles and the more pronounced as the disease is severe. As the disease subsides, the diazo-reaction diminishes. It was sometimes observed in the prodromal stage of measles, and it persists until the end in the fatal cases, having thus great prognostic value.—*St. Petersb. Med. Woch.*, December 25.

Percussion of the Skull.—It was announced at the Italian Congress of Surgery, which concluded its sessions at Rome, October 30, that percussion of the skull is perfectly practicable and will be found a valuable aid in diagnosing. E. De Paoli and A. Mori have made an extensive study of the subject, and state that the sound obtained by percussion with the fingers is produced by the vibrations of the bone walls, the contents of the skull and the air in the buccal cavity. Any modification in the sonority indicates an intracranial lesion and also its exact location. The sound obtained by percussion of symmetric points is identical if both are normal. They introduced the yolk of an egg, blood and other substances, into the skulls of cadavers, and the variations in the percussion were instructive. Applying the results of these experiments to patients with circum-

scribed lesions, they diagnosed positively by percussion, the exact location of cerebral abscesses, hematoma under the dura mater, localized meningitis, etc., and the diagnosis was confirmed in every point by the operation or necropsy later. When percussion is painful they use the stethoscope placed on the bregma.

Memorial to Billroth.—The portrait memorial erected to Billroth under the arcades of the Vienna University was unveiled November 7, in the presence of a brilliant assemblage which included numbers of his former pupils who had traveled far to do honor to his memory. He is represented standing at the desk with the scalpel in his hand. We notice in the address of Professor Gussenbauer, his successor, the following tribute to an American; speaking of Billroth's famous motto, *Durch Klarheit zur Wahrheit*, which inspired all his scientific work, he added: "When the famous surgeon Samuel D. Gross of Philadelphia, was present at a lecture by Billroth, on 'Neoplasms,' he remarked to him, 'I congratulate myself on having heard your lecture; you talked to your students with such truth, such rare truth.' This testimony is sufficient, as it came from no less a one than Samuel Gross."

Can Order Surgical Examination in Divorce Case.—Judge Russell holds, at a special term of the supreme court, New York County, in the case of Cahn vs. Cahn, October, 1897, that, in an action for the annulment of marriage on the ground of physical disability of the defendant at the time of the marriage, and since continued, the court can direct a surgical examination of the person of the defendant, in aid of the charge which is the foundation of the action. The judge admits that the New York Civil Code does not provide for such an examination, Section 873 thereof referring only to examinations of the kind in cases of demands for personal injuries; nor does he find any decision of the courts of that State since the adoption of the Code of Procedure in 1848 which provides for such an emergency. On the other hand, the inherent power of the court has been held not to extend to an examination of the person by surgeons in an action for personal injuries. Nevertheless, he pronounces in favor of this extreme exercise of the directing power of the court, to be enforced, if necessary, by contempt proceedings. Without the exercise of such a power, he says, the court would be impotent to decree annulment of marriages obtained by fraud of this nature. The defendant could simply resist the sufficient proof, obtainable alone by an examination of his person, relying upon the well-known rule of the courts to refuse annulment of the sacred tie of marriage unless upon satisfactory proof, and thus hold the innocent consort to the perpetual burden of a marriage with a sexless husband.

Identifications of Organs for Analysis.—The evidence in a murder case fully identified and accounted for the whereabouts of certain organs from the time they were taken from the body of the deceased until they reached a Chicago toxicologist, except for the space of an hour or so when they were left sealed in the office of a physician, while he went to dinner, and while they were in transit, by the express company, to Chicago. If they were properly delivered to the express company for shipment to the toxicologist, in Chicago, as the evidence showed they were, this, the supreme court of Iowa holds, State vs. Van Tassel, October 1897, was sufficient to cover the period of time necessary to their shipment. When the physician referred to went to dinner, he left the jars, containing the organs he had removed from the body of the deceased, in his office, but he testified that they were locked up in a commode, and that he also locked the office door when he was away, and that no one was in the room while he was gone. The city marshal assisted the physician in packing the jars containing the organs taken from the body of the deceased, and, as soon as they were packed, the marshal took the box, and delivered it to the assistant express agent, who held it in his possession and had it under his immediate supervision, until it was shipped to Chicago. The toxicologist received the box in the apparent condition in which it was when shipped, and analyzed the contents of the jars. Surely, holds the court, this was a sufficient identification to justify the admission of the toxicologist's evidence. That there was some little conflict as to the number of jars sent and received, the court does not consider of itself sufficient reason for rejecting the evidence.

The Antivivisection Bill.—The following has been mailed to each senator and congressman from Illinois:

JERSEYVILLE, ILL., Jan. 23, 1898.

To the Hon. ———. *Dear Sir:*—We, the physicians of Jerseyville, Ill., earnestly urge you to oppose the passage of Senate Bill 1063; Calendar 138; entitled, "A Bill for the Further Prevention of Cruelty to Animals, in the District of Columbia." Our reasons for opposition are these:

1. Its enactment would serve as a precedent for the passage of similar bills by the legislatures of the various States.

2. Such legislation would do irreparable harm to countless men, women and children.

3. The knowledge gained by experiment upon living animals enables us to save thousands of people that otherwise would have died.

4. The knowledge thus gained in regard to diphtheria alone, is enough to convince any one that the suffering inflicted upon the lower animals, to gain such a knowledge, has been amply repaid.

5. The aim of such experiments, is not to inflict suffering, but to ameliorate the suffering of mankind.

6. Legislation, such as Bill 1063, is directly opposed to the progress of science, the healing of wounds, and the saving of life. Therefore, we oppose it and sincerely hope that you will use your vote and influence toward its defeat.

Yours very truly,

Drs. C. DuHadway, J. S. Williams, Edward L. H. Barry, A. A. Shobe, Thomas A. Kingston, W. W. Estabrooke, C. R. Enos, A. K. VanHorne, A. A. Barnett, H. R. Gledhill, A. G. Porter, Albro B. Allen, J. W. Enos.

Doctors not the only Ones who Cannot Remove the Buried.—A North Carolina statute provides "That any person who shall without due process of law, or the consent of the surviving husband or wife, or the next of kin of the deceased, and of the person having the control of such grave, open any grave for the purpose of taking therefrom any such dead body, or any part thereof buried therein, or anything interred therewith, shall be deemed guilty of a felony." It was suggested by the defendants, in the case of State vs. McLean, they being the mayor and commissioners of the town of Burlington, with the keeper of the town cemetery, that the mischief intended to be suppressed by the statute was the desecration and robbery of the graves of the dead, and that the spirit of the statute did not, if its letter did, make it an offense for them to command, counsel, and procure the opening of a grave in an unpaid-for lot and the removal therefrom of the dead body to the free part of the cemetery. But the supreme court of the State declares, Nov. 9, 1897, that the statute is directed against all who disturb the last resting place of the dead, except those who act under the due process of law, or who procure the permission to open the graves and remove the body, from the surviving husband or wife, or the next of kin of the deceased, and of the person having control of such grave. Why, the court asks, should it be thought that the law should apply to those only who open a grave, or procure it to be done, and have removed dead bodies, for purposes of medical or surgical knowledge, or for purposes of larceny of anything buried with the body? If a surgeon can be convicted for employing a person to open a grave and remove therefrom a dead body, his purpose being to advance medical and surgical science, again it asks what reason can be urged

against the conviction of persons who command a grave to be opened and the body to be removed because the lot of land on which the deceased has been buried is not paid for by his next of kin. It is hardly necessary to add, the court affirms a conviction of the defendants in this case.

New York as a Business Community and Dispenser of Charities.—The Controller of the State of New York in a recent report points out that the per capita cost of government in New Jersey is $1.60; in Pennsylvania $2.42; in Massachusetts $3.48; while in New York it is $4.49. To this statement objections have been made regarding the basis of comparison and the unreliable factor in governmental figuring in general, but when the Controller indicates that in seventeen years the number of State commissions and departments has been increased by thirty-six, and that the State expenditures, which in 1881 were $9,378,214, amounted in 1897 to $26,962,705, he inevitably raises the question whether there has been a corresponding return to the people in security and happiness. "The average citizen," says a secular contemporary, "is little, if any, better off, so far as the State government is concerned, than he was in 1881, and there has been no such increase in population as to warrant a trebling of expenses." "So long as it is practical," continues this authority, "the people will not object to the cost. What they do object to is the building of palaces for public institutions. The governor himself has spoken of this abuse, and spoken wisely. We want our dependents to have good care, and even some luxuries, but we do not want money wasted on great piles of architecture for the glory of some small town and to flatter the vanity of managers." Thus it appears that neither the public nor even its meek element, the medical community, are receiving the benefits to which they are entitled, while the objects of their care and indirect charities are not proportionately grateful.

Fruit as a Food for the Aged.—Sir Isaac Holden, who recently died in his ninety-first year, was neither a teetotaler nor a non-smoker. Sir Isaac was a man with theories. According to him the two great essentials for those who would live long and be healthy, are plenty of fresh air and plenty of fruit. His rule was never, if he could help it, to spend less than two hours a day in the open air. When he entered his first situation he said to his employer that he would be glad to have an hour daily in the afternoon for a walk. If granted he would not ask for any holiday, or would make up otherwise for the time so spent. This was agreed to. Sir Isaac took his walk daily, and to this, he used to say, he owed both health and fortune. In addition to fresh air he believed in plenty of fruit. Sir Isaac was not a vegetarian. It was not meat but bread from which he abstained. Like Wesley, whose "Natural Philosophy" he studied when a boy, he saw in farinaceous food a thing to be avoided by the elderly. "I take for my breakfast," he said a few years ago, "one baked apple, one orange, twenty grapes, and a biscuit made from bananas. My midday meal consists of about three ounces of beef or mutton, with now and again a half-cupful of soup. If I take a little fish, I take so much less meat. For supper I practically repeat my breakfast menu." The orange was his favorite fruit. Wine he eschewed; but on returning from the House of Commons to Queen Anne's mansions he had a tumbler of whisky and hot water before going to bed. He took no drink with his food, and this obliged him to masticate well. He smoked two or three cigars a day, from which he used to say that he derived both comfort and benefit.—*The Life Bulletin.*

The Ohio Colony for Epileptics.—The colony for epileptics at Gallipolis, Ohio, was instituted in 1893, and Dr. H. C. Rutter has, in a late number of the *Charities Review*, given an interesting account of the methods pursued there and the beneficent results achieved. He calls attention to the improvement in personal appearance and manners, produced by the mere fact of association in which a patient who has been allowed in his isolated home to pay no attention to the desires or feelings of others finds that he must exercise self-restraint; "the social influences of the institutions are manifest even in the most degraded, and especially in the younger patients." Those who have had an epileptic in the family know what a burden of care is imposed by the constant necessity of watchfulness lest the patient fall in some spot where there are hidden dangers, or from high flights of stairs, etc. Dr. Rutter calls attention to the safety that comes from many of them being together. The onset of a paroxysm is marked by a peculiar cry, and in the colony the instant that cry is heard all else is dropped and the other patients rush to the aid of the one attacked and the result is that there is seldom a serious accident. In Gallipolis no serious accident has occurred for more than two years among the more than eight hundred persons treated; and to show the value of this brotherly care, it is stated that among the 200 patients who have made temporary visits to their homes during that time no less than fourteen have met with fatal accidents and several others with serious ones. Taking all the patients in any one of these colonies together there is a great increase of happiness, and the weary unoccupied hours are lightened for them by employment, of which there are many kinds. The number of attacks have been reduced more than 300 per cent. among Dr. Rutter's patients, and at the close of the last fiscal year fifteen patients were discharged cured, *i. e.*, more than two years have passed since the last attack.

College of Physicians and Surgeons, New York.—The following changes in the faculty are noted in the *Columbia University Bulletin* for December: James Ewing, M.D., has been made instructor in clinical microscopy; Charles Norris, M.D., tutor in pathology; Frederick S. Ward, M.D., William R. Williams, M.D., and Frederick H. Floy, M.D., assistants in normal histology; William T. Neuman, M.D., assistant in bacteriology; Francis C. Wood, assistant in clinical microscopy; George P. Biggs, M.D., demonstrator of pathology. The new course in clinical microscopy, for fourth year students, has been inaugurated under the direction of Dr. Ewing. This is the first year in which hospital clinical instruction to small sections of students has been given, and the fourth year students express great satisfaction at the courses now under way. The chief feature of this instruction is the bedside study of disease, each student watching the progress of a number of patients in the hospital wards at Bellevue, getting full records of the cases from day to day, and having all the advantages of observation which are obtained by the resident staff in the hospitals. The increased facilities for instruction at the Sloane Maternity Hospital are also highly appreciated by the students. In the department of diseases of children, Professor Jacobi has added to his regular weekly clinic a new weekly hour, Fridays at 3 P. M., in the St. John's Guild Hospital, 155 West 61st street, to which he has been invited by the Board of Governors, to take classes of students for bedside instruction. The alumni and friends of the University are, however, well aware that systematic and thorough bedside instruction can not be attained before the college has its own hospital with daily attendance. The attention of alumni and friends is called to this fact in the same spirit in which the subject was empha sized by President Low in two of his annual reports. In addition to the regular clinic in orthopedic surgery, held by Professor Gibney, a special course to students, in sections of ten men each, is given by him this year for the practical demonstration of the fitting of surgical apparatus to deformities. Dr. Watson L. Savage was appointed advisor in physical training in June, 1897. During his college course at Amherst, Dr. Savage was very prominent in athletics. For several years he has been engaged in the work of physical training. Dr. Savage served three years on the Amherst Athletic Advisory Committee, and was medical director of the Columbia College

Crew for two years. The new director brings to Columbia the results of a long and varied experience in physical training. The medical school had 729 names upon its student's registry on Nov. 1, 1897.

A Missionary Hospital in the North.—The Dynevor Hospital has been established on the St. Peter's Indian Reservation in Winnipeg, chiefly for the benefit of a community of about 1200 families of red men. The sickness-rate having of late years been very heavy the missionaries of the Church of England opened a small hospital in March, 1896. This charity now consists in a dispensary, a surgery, two wards capable of holding a dozen patients, also a small emergency ward and several rooms that can be utilized for patients, when the other wards are overcrowded. The medical superintendent is Dr. Rolston, a retired fleet-surgeon, who served twenty years in the British Navy in the Baltic during the Russian war, on the North American, West Indian, Australian, and the New Zealand stations. In Canada, he volunteered as surgeon to Major Boulton's scouts, and at Fish Creek and Batoche, etc., he was conspicuous for his bravery on the field. During the first year of the hospital's existence over 1300 patients have been under treatment, thirty-two of these actually inside patients, although this latter gives a very imperfect idea, as many who ought really to be in the ward prefer to sleep away, and many during summer months come from long distances and camp (with their families) close to the hospital, all of whom require feeding, washing and nursing, more or less.

Camphor Intoxication.—The absolute fatal dose of camphor is said to be seven grams, states Barkholz in the *St. Petersburg Med. Woch.* of January 1, and then reports a case in which a young married woman took fifteen grams at once, in water, and experienced no ill effects for a couple of hours, when suddenly convulsions and acute mania developed. He was hastily summoned and applied the stomach-pump, giving later three grams of chloral and the same amount of potassium bromid. The patient rallied and recovered completely in two or three days. He explains the non-fatality of the dose by the probability that a large part of the camphor must have passed into the intestines during the two hours before its effects were felt. Here it was chemically changed into camphorol, and this was then oxidized into camphor-glycoron acid, which no longer possesses the intoxicating properties of camphor. Glycoron acid is a product of dextrin and other carbohydrates, and he mentions that in this case the patient had eaten a large amount of carbohydrates at supper, after taking the camphor. He therefore suggests that sugar administered in large quantities in camphor intoxication would be an efficient antidote. The symptoms of the present cases corresponded typically to he experimental tests with camphor described, only the convu.sions were less prominent than the psychic disturbances.

Disturbed Innervation the Cause of Lack of Compensation in Valvular Insufficiency.—A series of experiments at Budapesth, producing artificial valvular insufficiency and dividing the vagi, seem to demonstrate that alterations in the nervous system play an important part in preventing compensation in cases of valvular insufficiency. The vagus is the intermediary between the heart and the extracardiac nerve centers. After both vagi were severed in these experiments, the special nerve mechanism of the heart was sufficient to carry on the work of the organ unaided for a certain length of time, but this period was much shortened if, in addition to the severed vagi, there was also valvular insufficiency. Likewise, the heart carried on its work in spite of valvular insufficiency, when the innervation was undisturbed and even one vagus was left. The same results were obtained alike with cats, rabbits and dogs, leading to the inference that the cause of lack of compensation in a person with valvular insufficiency is some functional or anatomic disturbance in the cardiac innervation, rather than in the cardiac musculature. Numerous clinic symptoms confirm this assumption: arhythmia, etc., and Ott's statement that he found the nerve cells degenerated in cases of "incompensation."—*Deut. Med. Woch.*, January 6–13.

Tissue Changes Effected by Tuberculin.—Kasparek records the results of an important series of investigations into the action of tuberculin on healthy and tuberculous animals. His first object was to determine in some measure the relation between the reactions produced by different varieties of tuberculin. Preparations were made from human and avian tuberculosis by concentrating six to eight weeks' cultures to .125 or .1 per cent. of their bulk. It was found that eight times the quantity of bird tuberculin was required to produce the same effect in the experimental animals (guinea pigs) as a given dose of the human product; a good deal depended on the body-weight of the animal, and guinea pigs of as nearly as possible the same weight were selected in consequence. These precautions having been taken, the author was able to demonstrate that the tuberculin reaction was constant in diseased as distinguished from non-tuberculous animals. He next investigated the length of time which elapsed after infection with tubercle bacilli before the reaction was obtainable. When infection was accomplished by the injection of bacilli into the abdominal muscles the reaction appeared in thirty-six to forty-eight hours, at a time when no macroscopic lesion could be detected, though the bacilli were multiplying at the seat of injection. The fact that no reaction takes place at first shows that it is an actual tissue change in the animal and not the mere presence of bacilli which renders it so susceptible to the influence of tuberculin. This is confirmed by the fact that the substitution of an equal amount of living tubercle bacilli for the tuberculin gives no reaction whatsoever. When the tuberculous infection was effected by means of inhalation no reaction was obtained until after six daily exposures of an hour each; whenever it was obtained the animal eventually succumbed to tuberculosis. This shows the extraordinary diagnostic value of tuberculin. The last series of experiments consisted in the injection of tuberculin into the animals which had been weakened previously by diphtheria toxin. Fever resulted in these cases but was not of the same type as that constituting the tubercle reaction, than which it lasted at least five or six hours longer. Kasparek's conclusions are as follows: 1. The tuberculin reaction occurs very early (thirty-six to thirty-eight hours) in animals infected with tubercle, as soon, in fact, as the slightest amount of tissue change has taken place. 2. The activity of a tuberculin preparation varies with the source from which it is obtained. 3. The fever evoked by tuberculin in animals weakened, for example, by diphtheria toxin is distinguishable from the typical reaction by its greater duration.—*British Medical Journal.*

The Prospectus of the International Bibliographic Bureau has been received. Its aim is no less than to supply subscribers with a comprehensive card catalogue on the decimal system of all scientific publications, past, present and future on zoology, anatomy and physiology. It is not a commercial undertaking; the cost of subscription will merely cover the necessary expenses, never over two francs per hundred cards, and probably one franc or less, depending upon the number of subscribers. They will be supplied with the card catalogue on white cards. Brown duplicates are furnished on demand, which are substituted for the white cards as you acquire possession of the article or book designated on them. The white cards thus removed serve as a separate catalogue of your private collection. The bureau is associated with the "Bibliographia Anatomica" and the "Bibliographia Physiologica" edited by Prof. C. Richet of Paris. The price of the various parts of these are from six to ten francs each in book or card form. All anatomists, physiologists and zoologists are urgently requested to co-operate

with the bureau, and notify them of their publications as soon as they appear. This appeal is endorsed by many scientific investigators "especially Professor Bowditch." The decimal card catalogue system is too well known to describe, but we add an example to show its usefulness. If investigating various methods of counting the blood corpuscles we turn to Physiologia 612; under this we find sanguis, circulatio 612.1; proprietates generales sanguinis 612.11; globuli 612.111, and numeratio globulorum 612.111.2, under which head we find the full titles of all the articles that have appeared on the subject, including those by Bleibtreu, Eykman, Marschner, Oliver and others with exact data where they are to be found, and mention of those among them which are replies to others.—Concilium Bibliographium, Zürich, Oberstrass.

The New Formalin Test for Bile Pigments.—Prof. A. Gluzinski writes to the *Wien. klin. Woch.*, December 30, that if a little formalin is added to human or animal bile it turns green in twenty-four hours, but if boiled for a few minutes, the emerald green appears at once. This can be changed into an amethyst violet by adding a few drops of any mineral acid, especially hydrochloric. Testing to see to which of the bile pigments this coloration could be ascribed, he found that if mixed with chloroform, the green changed to violet only when biliverdin was present. He also found that biliverdin, unlike the other bile pigments, showed two absorption bands in the spectrum after the addition of the formalin and hydrochloric acid. Alkaline solutions of bile pigments show a still more decided green in contact with formalin, changing to blue as the hydrochloric acid is added. To test urine for bile pigments, he has an equal quantity of urine in two test tubes, and boils one, after adding one-third formalin, when it turns green. Pouring this into a third test tube he adds a few drops of hydrochloric acid, when the color changes to violet. This test is extremely delicate, showing even in a 1 to 100–140 solution. This experience has convinced him that the bile pigment in icteric urine is almost exclusively biliverdin.

The Intracranial Circulation in some of its Aspects.—As the result of an experimental inquiry Elder (*British Medical Journal*, Nov. 13, 1897, p. 1414) has arrived at the following conclusions: 1. In the unenclosed skull there are two very evident forms of pulsation of the brain: *a*, the arterial; *b*, the respiratory; the former produced in the arteries, the latter in the veins. 2. In the closed skull the venous side of the circulation is of the greatest importance, and respiration acting through the veins takes an important role in the intracranial circulation. 3. During inspiration in the open skull the aspiration of blood from the cranial veins is accompanied by compression of the vessels and retraction of the brain. 4. In the closed skull a similar withdrawal of blood from the veins occurs, accompanied by decrease in the intracranial pressure. 5. There is no flow of cerebrospinal fluid from the spinal cavity to the intracranial cavity, either with respiratory movement or with arterial pulsation, as has usually been supposed. 6. In all probability, accompanying the emptying of the large veins during inspiration, there is dilatation of the arteries. (This may be accompanied by an increased rate of flow in the carotid artery as compared with the other arteries in the body above the level of the diaphragm, which are otherwise under somewhat similar conditions.) So during expiration the dilatation of the intracranial veins will be accompanied by narrowing of the arteries. The flow of blood through the capillaries will remain constant. 7. With arterial pulsation lateral pressure is exerted on the intracranial veins, leading to an increased flow of blood from the skull. 8. These movements of the veins, with respiratory movements and with arterial pulsation, will occur in the large veins leading into the intracranial venous sinuses, the walls of which are themselves incompressible. 9. Similar movements of alternating compression and dilatation of the arteries and veins probably occur also in the spinal column, the cavity of which is to be looked on as being practically closed, just as the cranial cavity is. 10. In all cases of sudden increase of pressure affecting both cranial and spinal cavities there will practically be no variation in the quantity of blood present in the cavities. There will only be either: *a*, a variation in the amount of blood in one side of the circulation as compared with the other, arterial at the expense of the venous, or vice versa; or *b*, an alteration in the rate of flow through the capillaries. In rises of pressure lasting some time there may be alteration of the quantity of blood inside the cavities, resulting from alteration in the rate of secretion or of absorption of cerebrospinal fluid. 11. The point of importance in alterations of pressure inside the skull is the rate of flow through the capillaries. Steady flow through the capillaries, "adiæmorrhysis," as it has been called by Geigel, may go on under very low intracranial pressure or under comparatively high (Hill). 12. Increased intracranial pressure from an effusion into the cranium; *e. g.*, a hemorrhage, leads first of all to a flow of cerebrospinal fluid from the cranial to the spinal cavity, so giving a respite for a certain length of time to the intracranial circulation. If the effusion goes on, there is first, compression of the larger veins, which leads, after it has taken place to a certain extent, to interference with the flow of blood through the capillaries, and if the pressure continues to rise, to actual compression of the capillaries and true anemia of the brain. 13. When tracings are taken of the pulsations of the brain, with rise of pressure two forms of pulse wave may be seen, 1, when wave is less ample and still anacrotic, as it is under normal conditions; 2, where wave is higher and tends to become catacrotic. The former occurs much more frequently than the latter, and seems to be present in what may be termed "passive" increase of intracranial pressure, that is, when the intracranial pressure is increased from alteration in the circulation in the rest of the body. 14. In some conditions the intracranial circulation seems to vary independently of the circulation elsewhere. This would tend to show that although the blood vessels of the brain are not generally controlled from the general vasomotor center there must be some local mechanism for altering their caliber.

Strangulated Hernia in Infancy.—Strangulated hernia in infancy is of rather uncommon occurrence. Among 139,000 children treated in various hospitals, Stern (*Centralblat für Chirurgie*, 1894) found no record of any case of herniotomy for strangulation; and of 1,900 cases operated upon for strangulated hernia in various hospitals, but thirteen occurred in children. Nussbaum operated upon two cases among a total number of 54,000 children under his care. A study of the statistics that have been collected shows that operations are more frequently called for during the earlier months of childhood than during the later, and that the symptom most commonly observed in children, or perhaps what should be called an associated condition rather than a symptom proper, is retention of urine. Reports of two cases of strangulated hernia in infants have recently appeared. The first is made by Moynihan (*Lancet*, Sept. 25, 1897, p. 788), who relates the history of a male child, twenty-two days old, in whom right-sided inguinal hernia had been noted from birth. Following an attack of crying the swelling increased in size, and attempts at reduction were unsuccessful. Within an hour the child had begun to vomit and had continued to do so at intervals that were growing gradually shorter. For about twelve hours no urine had been passed. Examination disclosed the presence of a tense inguinal hernia on the right side of approximately the size of a billiard ball. Attempts at reduction with and without chloroform anesthesia were unsuccessful, and operation was at once undertaken. The sac of what proved to be a congenital hernia, contained a little fluid and about ten or twelve inches of distended and discolored small intestine, with a point of strangulation at the neck of the sac. The inguinal rings were stretched with the finger and the gut returned, the operation being complete by performing a radical cure by Ball's method and by fashioning a tunica vaginalis from the lower part of the sac. A dressing of collodion and gauze was applied. The child passed urine during the operation. The after-history was uneventful and

recovery was speedy. The second case is reported by Cuff (*British Medical Journal*, Sept. 25, 1897, p. 811). The patient was a badly nourished and weakly child, 5 months old, that had been vomiting continually for thirty-six hours. There was complete constipation and a large hernia was present on the left side. The latter had been present from birth and was gradually increasing in size. The more recent enlargement was attributed to cough from which the little patient suffered. Examination disclosed the presence of a large, tense mass, which filled the left side of the scrotum and could not be reduced. The child looked extremely ill, kept up a continual cry, had a small, rapid pulse and vomited intermittently. The legs were kept drawn up on the abdomen. The vomit was a thin, yellowish fluid, free from fecal odor. The temperature was subnormal. Taxis failing, herniotomy was resorted to. An incision was made above and parallel to Poupart's ligament, the sac being opened and found to contain clear fluid and seven or eight inches of congested gut, which was tightly held at the neck of the sac at the internal ring. After incision of the ring and inspection of the gut, the latter was returned, with some difficulty, to the abdomen. The upper part of the sac was then dissected off the elements of the cord, a small portion left attached to the testicle and the upper part twisted up to the internal ring, its end being then brought through the internal pillar and attached there with a catgut suture. The wound was closed with a continuous silk suture and sealed with collodion and powdered iodoform. Small quantities of warm diluted milk were given at short intervals, and the child was dismissed on the twenty-second day.

The "Baldeo" Treatment of Yellow Fever.—Pena y Buelta of Trinidad, Cuba, announces that he has cured thirty-three in thirty-four severe cases by the following method: A pail (balde) of tepid water is placed at the bedside, with a kilogram of sodium sulphate, a tablespoon and a tumbler. Three tablespoonfuls of the sulphate dissolved in a tumblerful of the tepid water are administered to the patient; then, at an interval of one or two minutes he drinks other tumblerfuls, each alternate one containing a tablespoonful of the sulphate, until he has taken ten tumblerfuls and copious vomiting has been produced, with mechanical compression of the liver and gall bladder by the efforts at retching. A quarter of an hour after the vomiting has ceased repeat the process again; then half an hour after the last vomiting give the patient half a glass of water, not tepid, containing a spoonful of the sulphate; and fifteen minutes afterward another similar glass. If vomiting is produced, repeat at the same intervals until vomiting has ceased. This causes purging which cleanses the intestines. Six hours after the first attempt repeat from the beginning. Continue in this manner until the fever has vanished, using no other medication and allowing no food nor drink except water. "It will cure if commenced in the first four days of the disease, and it will cure many even at a later period. Three or four repetitions are sufficient; the eyes lose their excessive brilliancy and the skin feels cool to the hand; the patient is cured."—*El Monitor Médico*, No. 245.

Infant-Feeding.—From a survey of the attitude of the medical profession upon the question of infant-feeding, Holt (*Archives of Pediatrics*, Vol. XIV, No. 11, p. 816) summarizes as follows the points that may be considered as well established: 1. Good breast milk is the best infant food. 2. No substitute for breast milk can be trusted that does not furnish essentially the same elements, fats, sugar, proteids, etc., as breast milk. 3. These elements are found only in the milk of other animals, cow's milk being the only one that is available for general use. 4. Cow's milk requires some modification before it is fed to infants, because the proportions of the different elements, fat, sugar, etc., are not the same as in breast milk; and because some of these elements, notably the proteids, are not identical with those of breast milk. Among the important questions in infant-feeding that are still under discussion are: 1. Whether all milk should be heated and, if so, to what temperature and for what time; whether the purpose shall be mainly to destroy pathogenic germs, or to improve the keeping properties of the milk; also whether heating improves its digestibility or the contrary. 2. What the standard of a "clean milk," bacteriologically speaking, shall be; also whether the exclusion of pathogenic germs by care and intelligence and a reduction in the number of saprophytic forms by scrupulous cleanliness in milk-production may not furnish what is needed; clean milk a few hours old, which will have all the advantages of Pasteurized milk without any of its possible disadvantages. 3. Whether such accurate modification as is measured by variations of a small fraction per cent. is really essential or whether less accurate modifications may not give equally good results, provided the original milk is the best possible. Much is still to be learned regarding precise indications for varying the proportions of the different elements in milk-modification.

Louisville.

WATER.—Louisville is in a fair way to soon enjoy the luxury of a filtered city water-supply. The water during the recent high stage of the river has been of a chocolate color, and was about the consistency of thin molasses, so heavily loaded was it with mud. This is the city's experience with every high water and the assurance that we will have filtered water before many months is most welcome news. The investigations which the water company have been conducting at the pumping station have proven the sand filter to be the most efficacious, taking into consideration the rapidity of work, and the state of the water at such seasons as this. The plan is to utilize the two big basins now used as reservoirs, as subsiding basins, where the water will be allowed to settle sufficiently to relieve it of much mud and other impurities. These basins are high enough to allow the water to pass mechanically into the sand filters, which will be above the clear water basins. From the clear water basins, into which the water runs from the sand filters, the water will be pumped into an immense stand-pipe, of sufficient height to throw the water over the highest buildings in the city. There will be from eighty to one hundred sand filters, each from eighteen to twenty feet in diameter, and with three feet of sand in the bottom of each to catch the impurities before the water reaches the clear water reservoir, which will have a capacity of 25,000,000 gallons. The water will be treated chemically as it passes to the subsiding basins, this coagulant causing the mud to sink to the bottom and assist the filters of relieving the water of both impurities and bacteria, it being estimated that less than 50 per cent of bacteria will remain after the water reaches the mains. The entire cost of the improvements will be in the neighborhood of $300,000.

Philadelphia.

THE COLLEGE OF PHYSICIANS.—The subject of the utility of placarding houses in which cases of scarlet fever and other infectious diseases occur has recently attracted considerable attention, and it was brought up on the second instant before the college by a resolution which had been referred from the December meeting, viz., "That a committee of three be appointed by the president of the college to wait upon the board of health and represent to it the sense of this college upon the subject, and to ask that the board cease its present practice of placarding all houses in which there occur such cases of contagious disease." The question was fully discussed, the subject being opened by a paper by Dr. Arthur V. Meigs entitled "Reasons why the Placarding of Houses in which are Persons Suffering with Scarlet Fever and some other Contagious Diseases should not be continued." The discussion was opened by Dr. James Tyson. At the same meeting Dr. George Enly Shoemaker read a paper entitled "Some Results of a Series of One Hundred Abdominal Operations;" and Dr. James Hendrie Lloyd reported a "Case of Cysticercus Cellulosæ of the Brain." Dr. Henry W. Stelwagon exhibited two cases of alopecia areata.

YELLOW FEVER IN THE DELAWARE.—A slight clashing of the national and local health authorities has arisen from the fact that the U. S. Quarantine Station at Reedy Island being tem-

porarily out of service, an infected vessel proceeded up the river until boarded by the State quarantine officials at Marcus Hook, and the latter immediately took charge and proceeded to enforce the full regulations. The schooner *John H. Tingue*, after unloading a cargo of coal at Kingston, Jamaica, had gone to Black River and taken on a load of logwood for Chester. Three of the crew were found to be ill with symptoms of mild yellow fever and they were removed to the hospital. The rest of the crew and ship were cleansed and disinfected, small fumigators generating formaldehyde being used. The government quarantine station at Reedy Island was at once reopened, January 21, and the officials sent a formal request that the ship be sent down the river and placed in their charge, which the State authorities politely declined to do. It was explained that the ship had passed the Marcus Hook government station during very stormy weather and had passed the Reedy Island quarantine because it was out of service.

DIPHTHERIA.—The yellow placard indicating the gruesome fact that "Diphtheria" is the unwelcome guest in the household, seems conspicuously out of place upon a physician's door post, and yet during the past week the friends of Dr. S. Weir Mitchell have been pained by seeing the formal notice of the Board of Health standing guard at his front door, unfortunately soon to be attended by the black flag which announced the death of his only daughter, a young lady just entering society. It is reported that Mrs. Mitchell has also been suffering with a mild attack of diphtheria. The sympathies of the entire profession and community are with the distinguished author and teacher in his great affliction.

Detroit.

AT THE REGULAR MEETING of the Detroit Medical and Library Association January 31, Dr. H. O. Walker read a paper on "Gastrectomy." After referring to Schlatter's unique case, which the Doctor denominated a "surgical freak," and reviewing the meager literature on this subject and commenting upon the use of the term gastrectomy as a misnomer for pylorectomy, the essential points in the surgical anatomy were set forth. Stress was laid upon the abundant arterial and venous supply, the numerous anastomoses of these vessels, the omental attachments on every side and the difficulty to be experienced in manipulating the duodenum or pulling down the esophagus without injuring adjacent organs. A series of twelve experiments upon dogs was reported in detail with results thereof. In two cases the Murphy button was used in joining the esophagus and the duodenum. In another case it was tried, but experiencing difficulty in this and the remaining cases the duodenum was closed either by a purse-string suture or by two rows of continuous sutures and an anastomosis with catgut sutures, made of the lower end of the esophagus at right angles with the lower end surface of the duodenum or upper end of the jejunum. The operations were performed under ether anesthesia. Strict asepsis was insisted upon, extreme care used in preventing and checking hemorrhage, but the wounds all closed without drainage. The subjects all died at intervals of from three to forty-eight hours after the operations. Fluid from two to thirty ounces was found in the cavity postmortem. In two cases the wounds were observably septic. In all the others that lived a sufficient length of time the rectal temperature and pulse were found to increase above the normal, indicating sepsis. After describing in detail the technique used, the Doctor concluded that in his experience hemorrhage was more easily controlled in the human subject than in dogs; that the operation is too dangerous for general application; that cases are rare in which it will be adopted, and that, judging from the history given, Schlatter's case was peculiarly adaptable. Success in the removal of cancerous growths of the stomach will depend upon early diagnosis. Dr. Walker presented a specimen of malignant growth of the cecum which he had that day removed from a man aged 38 years, with the following history: Patient observed in January, 1897, that his health was impaired from some cause unknown to himself or attending physician. In February a diarrhea set in and continued more or less until operated upon. In May a small tumor was felt through the abdominal wall above McBurney's point, when his physician diagnosed appendicitis. Jan. 27, 1898, the date when the Doctor first saw him, he presented a suspicious malignant cachexia with emaciation and persistent diarrhea. Tumor could be felt beneath abdominal wall without difficulty. At no time was the tumor painful. The method of operation was as follows: Straight incision six inches in length made on right border of rectus muscle. Digital exploration revealed tumor involving posterior wall of colon, extending to within an inch of ileocecal valve and upward about seven inches. The adjacent mesentery was also involved. Enucleation was tedious though hemorrhage was slight. Fourteen inches of the colon was extirpated and about two and one-half inches of the ileum. The end of the colon was closed and a right-angled implantation of the ileum into the side of the colon was made with catgut sutures. The Doctor stated that the fatality in this operation was great, about 40 per cent., largely due to shock; in fact, in several instances collapse of patient during operation was so great that it became necessary to desist from further interference. The growth had not as yet been examined microscopically, but clinically there could be no question but that it was carcinomatous.

AT THE REGULAR MEETING of the Wayne County Medical Society February 3, Dr. R. Bishop read a paper on "Special Treatment of Rectal Diseases." The Doctor believes that diseases of the rectum are too much neglected by the medical profession and so errors in diagnosis are quite frequent. He would have more thorough examination of the rectum in all cases where symptoms point to disease of the lower bowel.

AT A RECENT MEETING of the Faculty of the Medical Department of the Michigan University the Board of Regents was asked to instruct the superintendent of the University hospital to exclude from free hospital treatment those who are abundantly able to pay for medical service. To get an expression from the physicians of the State on this subject the different medical societies were asked to bring the matter up in regular session. This question came up before the Detroit Medical and Library Association on January 31 and before the Wayne County Medical Society on February 3, each society being unanimous in its condemnation of the methods now in vogue in the University Hospital and passed resolutions asking the Board of Regents of the University to comply with the request made by the faculty.

Hospitals.

OPENING OF THE MAITLAND HOSPITAL AT NEW YORK CITY.—The opening of the New York Hospital for scarlet fever and diphtheria, at the foot of East Sixteenth Street, took place December 30. The hospital consists of two pavilions, forming the letter "U," each two stories in height, and built of pressed brick. The laundry and fumigating apparatus are in the center. A special feature is the solarium for the use of convalescent patients. It is situated on the south side of the building and has a wall of heavy plate glass. There is also a roof-garden. The beds are of iron, the chairs and table of agate, and the shelves of glass. The hospital was open for patients on the first of January. There are no free beds.

EVANSTON, ILL., has just completed her new hospital, a three-story structure, at a cost of $35,000.——The Cambridge (Mass.) Hospital is the recipient of $1,000 in memory of a former patient.——The clinic room of the Notre Dame Hospital, Montreal, Quebec, was destroyed by fire January 29. The loss, $5,000, was covered by insurance.——The will of the late Mrs. Josephine Mellen Ayer, widow of the J. C. Ayer, of patent medicine fame, leaves $50,000 to the Pennsylvania Hospital, Philadelphia.——According to the will of the late Judge

John M. Scott of Bloomington, Ill., his estate of $250,000 is eventually to found and establish a hospital in that city.—— Under the will of the late Charles H. Contoit, a wealthy New York bachelor, a large estate valued at more than $1,000,000 will fall to the benefit of nineteen hospitals and other institutions of relief and religion. Among the hospitals are St. Luke's Hospital, Tremont Home for Consumptives and St. Mary's Hospital for Children. These various beneficiaries are to receive share and share alike of the large residuary estate.

Societies.

The following meetings are noted:

Illinois.—Chicago Medical Society, February 2; McLean County Medical Society, Bloomington, January 28.

Massachusetts.—Norfolk District Medical Society, Brookline, January 25.

Michigan.—Grand Rapids Medical and Surgical Society, January 31; Northeastern District Medical Society of Michigan, Flint, February 4; Washtenaw County Medical Society, Ann Arbor.

Missouri.—City Hospital Medical Society, St. Louis, February 3; Jackson County Medical Society, Kansas City, January 27; St. Louis Medical Society of Missouri, February 5.

New York.—American Laryngological Association, Eastern Section, Albany, January 24; Otsego County Medical Society, Oneonta, January 18.

Ohio. — Northern Tri-State Medical Association, Toledo, January 27.

Pennsylvania.—Clarion County Medical Society, East Brady, January 25; Lycoming County Medical Society, Williamsport, February 1; McKean County Medical Association, Kane, February 2; Philadelphia County Medical Society, Philadelphia, January 26; Susquehanna County Medical Society, Halstead, February 1.

Texas.—Corsicana Medical Association, January 25.

Virginia.—Richmond Academy of Medicine and Surgery, January 25; Seaboard Medical Association, Norfolk, January 18.

Wisconsin. — Rock County Medical Society, Janesville, February 4.

CHANGE OF ADDRESS.

Archer, J. A., from Freeport, Ill., to De Lamar, Nev.
Ade, S. G., from 577 Fulton to 612 W. Madison St., Chicago.
Converse, E. D., from 100 to 126 State St., Chicago.
Dubs, R. S., from 100 to 92 State St., Chicago.
Foskett, W. A., from 1556 Milwaukee Av. to 298 Maxwell St., Chicago.
Jones, L. J., from 100 to 92 State St., Chicago.
Krotoszyner, M., from 41 6th St. to 700 Sutter St., San Francisco, Cal.
Looze, from Lincoln to Seymour, Wis.
Le Fevre, E., from Sidney, Ohio, to 323 Washington St., Boston, Mass.
Miner, S. G., from Jefferson Av. to 58 Cadillac Sq., Detroit, Mich.
Reynolds, G. B., from 711 Calvert to 809 N. Charles St., Baltimore, Md.
Spaulding, H., from 3141 Rhodes to 3351 Indiana Av., Chicago.
Schaefer, C. R., from 430 to 1202 Madison Av., Indianapolis, Ind.
Toron, M., from 637 Larabee St. to Palace Hotel, Chicago.
West, M., from Atlantic City to 722 Market St., Camden, N. J.

LETTERS RECEIVED.

Boroughs, I. H., Casstown, Ohio; Bennett, Arthur G., Buffalo, N. Y.; Brown, Mark A., Cincinnati, Ohio; Bradley, C. H., Minneapolis, Minn.; Brown, F. F., New York; Bowman, F. C., Duluth, Minn.; Berry, J. T. B., Brandon, Miss.

Collier, J. M., Plymouth, Mich.; Crothers, T. D., Hartford, Conn.; Craze, J. C., Lebanon, Pa.; Chase, Arthur H., Concord, N. H.; Cleaves, Margaret A., New York; Caldwell & Co., Jno., New York.

Douglas, Richard (2), Nashville, Tenn.; De Pew, H. H., Chicago.

Ehrhardt, H., St. Louis, Mo.; Elliott, H. G., New York.

Ford, Charles, New York; Frazier, W. C. & Co., Aurora, Ill.; Fischer, L., New York.

Gregory, C. L., Yreka, Cal.

Haven, O. D., Ravena, Ohio; Hunt, C. C., Dixon, Ill.; Hudson, R. D., St. Louis, Mo.; Hays, B. W., Gordonville, Mo.; Humphrey, Daniel, Lawrence, Mass.; Holmes, A. M., Denver, Colo.; Hummel, A. L. Adv. Agency, New York.

Jewett, R. D., Wilmington, N. C.

Knipp, H. E., Baltimore, Md.; Knapp, A. A., Brimfield, Ill.

Lucas, V. C., Cleveland, Ohio; Lerch, Otto (2), New Orleans, La.

Morrill, Chas. E., Nauvoo, Ill.; Marks, A. A., New York; McVey, W. E., Topeka, Kas.; Mills, H. R. Port Huron, Mich.; McKenzie, H. M., Elwood, Iowa; Merck & Co., New York.

Pantagraph Printing and Stationery Co., Bloomington, Ill.; Page, C. E., Boston, Mass.

Roop, H. B., Columbus, Pa.; Rio Grande Western Railroad, Salt Lake City, Utah.

Smok, C. W., Clarksville, Ohio; Sternberg, Geo. M., Washington, D. C.; Stokes, W. R., Baltimore, Md.; Squibb, E. H., Brooklyn, N. Y.; Stone, R. M., Omaha, Neb.; Sherwood, F. R., Chicago.

Taylor, R. H., Griffin, Ga.; Trade Advertising Co., The, New York.

Van Horne, A. K., Jerseyville, Ill.; Vedder, W. D., Mansfield, Pa.

Westcott, C. D., Chicago; Wingate, U. O. B., Milwaukee, Wis.; Walker, F. E., Iowa City, Iowa; Woodbury, Frank, Philadelphia, Pa.; Walker, H. T., Keokuk, Iowa.

PAMPHLETS RECEIVED.

Abuse of Medical Charity; Report to the Medical Society of the County of New York on Abuses of Medical Charity; Abstract of Proceedings of New York State Medical Association. By F. H. Wiggin of New York. Reprints from Medical News.

Angina Pectoris. By W. S. Connery of Saginaw, Mich. Reprinted from Medical Record.

Ano-rectal Imperforation, Surgical Treatment of. By Rudolph Matas of New Orleans. Pp. 100. Reprinted from Transactions of Am. Surg. Asso.

Cerebral Syphilis; Lues Venerea; Syphilis; Syphilis of the Innocent; Treatment of Syphilis; Non-venereal Syphilis. By Henry Alfred Robbins of Washington, D. C. Reprints.

Chloroform and Ether. By D. E. Keefe of Springfield, Mass. Reprinted from Boston Med. and Surg. Jour.

Clinical Studies of the Blood in Chorea. By Charles Howard Lodor of Chicago. Reprinted from Chicago Medical Recorder.

Congenital Phimosis. By Alex. C. Wiener of Chicago.

Deficient Excretion from Kidneys not Organically Diseased and Some of the Diseases Peculiar to Women, and Diseases of the Skin. By L. D. Bulkley of New York. Reprinted from Jour. Am. Med. Assoc.

Duties of Physicians to the Profession and their Relation to the Medical Charities of the District of Columbia. By Samuel C. Busey of Washington, D. C. Reprinted from Transactions Med. Soc. of D.C.

Electric Treatment in Gout and the Uric Acid Diathesis. By Robert Newman of New York. Reprinted from Medical Record.

Examination of the Urine as a Means of Diagnosis. By Theodore W. Schaeffer of Kansas City. Reprinted from Kansas City Medical Index.

Excessive Urobilinuria Following and Apparently Dependent on the Administration of Trional, by H. D. Rolleston; Intracardiac Thrombus Rising from the Fossa Ovalis, Projecting Through the Mitral Orifice and Giving Rise to Signs of Mitral Stenosis, by H. D. Rolleston and W. Ewart; Excision of the Cecum, by H. D. Rolleston and A. Marmaduke Sheild. Reprints from Clinical Society's Transaction, England.

Hematozoon Infections of Birds. By W. G. MacCallum of Baltimore. Reprinted from Johns Hopkins Hospital Bulletin.

Laporotomy for Diseases of Women from 1879 to 1889; Personal Experiences in Laparotomy; Diseased Ova. By Mary A. Dixon Jones. Reprints.

National Health Organization and Other Sanitary Needs of New Orleans. By Stanford E. Chaillé of New Orleans. Reprinted from New Orleans Med. and Surg. Jour.

Neurosis of Gout. By L. Harrison Mettler of Chicago. Reprinted from Medical Fortnightly.

Primary Sarcoma of the Pleura, Diagnosis of, from the Cells Found in the Pleuritic Exudate; Some Experimental Investigations as to Effects of Administration of Yeast Nuclein upon Leucocytes. By Alfred Scott Warthin of Ann Arbor, Mich. Reprints.

Pulmonary Tuberculosis; Fifty Cases Illustrating Successful Treatment. By W. H. Riley of Boulder, Colo. Reprinted from Modern Med. and Bac. Review.

Screw Worms in the Nose; Report of a Case of 207 Taken From. By Hal Foster of Kansas City. Reprinted from Kansas City Medical Index.

Strabismus in a Pure-blooded Negro. By Charles W. Kollock of Charleston, S. C. Reprinted from Ophthalmic Record.

Trade Pamphlets.

The Colorado Sanitarium. Illustrated. Boulder, Colo.

Treatise on Water Purification for Cities and Towns. New York Filter Mfg. Co., 120 Liberty St., N. Y.

Calendar. The Welch Grape Juice Co., Westfield, N. Y.

THE PUBLIC SERVICE.

Army Changes. Official List of Changes in the Stations and duties of officers serving in the Medical Department, U. S. Army, from January 29 to February 4, 1898.

Major Charles K. Winne, Surgeon, leave of absence granted on surgeon's certificate of disability is extended two months on surgeon's certificate of disability.

First Lieut. John S. Kulp, Asst. Surgeon, will report in person on Feb. 22, 1898, to the president of the examining board appointed to meet at Vancouver Bks., Washington, for examination as to his fitness for promotion.

Major Egon A. Koerper, Surgeon, is relieved from duty at Ft. Crook, Neb., to take effect upon the expiration of his present leave of absence, and will then report in person to the commanding General, Dept. of the Platte, for duty as chief surgeon of that Department.

First Lieut. Benjamin Brooke, Asst. Surgeon, is relieved from temporary duty at the Army and Navy General Hospital, Hot Springs, Ark., to take effect April 6, 1898, and will then repair to Washington, D. C., and report in person on April 12, 1898, to the president of the examining board, for examination as to his fitness for promotion, and upon the completion of his examination will report in person to the Adjutant General of the Army for orders.

A oard of officers to consist of: Lieut.-Col. William D. Wolverton, Deputy Surgeon General; Major John Van R. Hoff, Surgeon; Capt. Frank K. Keefer, Asst. Surgeon, is appointed to meet at Vancouver Bks., Washington, on Tuesday, Feb. 22, 1898, at 10 o'clock A.M. or at such time thereafter as practicable, for the examination of such officers of the Medical Department as may be ordered before it, to determine their fitness for promotion.

A board of officers to consist of: Col. Charles H. Alden, Asst. Surgeon-General; Major James C. Merrill, Surgeon; Capt. George D. DeShon Asst. Surgeon, is appointed to meet at the Army Medical Museum Building in Washington, D. C., on Tuesday, April 12, 1898, at 10 o'clock A.M. or at such time thereafter as practicable, for the examination of such officers of the Medical Department as may be ordered before it to determine their fitness for promotion.

The following named officers will report in person to the president of the examining board appointed to meet at the Army Medical Museum Building in Washington, D. C., for examination as to their fitness for promotion, and upon completion of their examinations will return to their proper stations: First Lieut. Alexander N. Stark, Asst. Surgeon; First Lieut. Charles Lynch, Asst. Surgeon; First Lieut. Edward L. Munson, Asst. Surgeon; First Lieut. Charles E. B. Flagg, Asst. Surgeon; First Lieut. James M. Kennedy, Asst. Surgeon; First Lieut. Guy C. M. Godfrey, Asst. Surgeon; First Lieut. William F. Lewis, Asst. Surgeon.